

EQUIPMENT

Mining

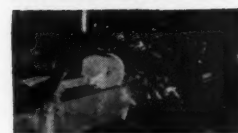
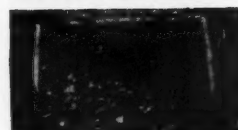
CONGRESS JOURNAL



DECEMBER
1944



Merry Christmas ☆ Happy New Year



Load and tamp carefully

Many times the blasting agent in use has been blamed for faulty results or misfires when some slight change in loading methods, depending on conditions, is all that is needed to provide perfect blasting. However, one fundamental rule is

Put in explosives of the right velocity and density . . .

The required characteristics are assured in AMERICAN explosives as they are products of intensive research, chemical control, thorough inspection and unremitting care in manufacture.

- ★ **HIGH EXPLOSIVES**
- ★ **PERMISSIBLES**
- ★ **BLASTING
POWDER**
- ★ **BLASTING
ACCESSORIES**

• *Capable field engineers are available at your call.*

American Cyanamid & Chemical Corporation



A Unit of American Cyanamid Company

**30 ROCKEFELLER PLAZA • NEW YORK, N. Y.
EXPLOSIVES DEPARTMENT**

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Mining

CONGRESS JOURNAL

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COVER: Geneva Steel Plant near Provo, Utah, largest integrated steel plant in Western America, being operated for the Government by Geneva Steel Co., U. S. Steel subsidiary.

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Opinions expressed by authors within these pages are their own, and do not necessarily represent those of the American Mining Congress.

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Everything you want in a Rock Drill...

**GREATER POWER ★ FASTER DRILLING
EASIER OPERATING ★ LESS UPKEEP COST**



Measured-Air VALVE ACTION

A positive short-travel tubular valve that powers all three types of Thor Rock Drills—Sinkers—Drifters and Stoppers—offers these advantages to provide *maximum forward and rotative power*... to assure *fast drilling*:



Powerful HOLE-BLOWING

Full-line power directed straight through the machine to the drilling point by exclusive Thor design in locating of exhaust ports provides exceptional hole-blowing power that offers these advantages:



Dependable ROTATION

Extra-heavy rifle bar assembly and positive-set ratchet action, plus *balanced* power piston action insures dependable rotation that *takes a fresh cut with every blow!*



THOR STOPPERS

SEPARATE, QUICKLY REPLACEABLE PARTS—On all Thor Stoppers, a threaded chuck, *separate* from the retainer body, can be easily and quickly replaced—yet is a tight seal that keeps out cuttings. Feed rod point and bearing are also *separate* parts that can be quickly replaced—of rugged steel construction and specially heat treated for longer life.

THOR DRIFTERS

TRIPLE HOLE-BLOWING FORCE IN THOR DRIFTERS provides *steady penetration*. A jet of air passes continuously through the steel to the bit... air and water under pressure at the point of drilling keeps the bit free of cuttings... and the hole can be given this extra *full-line* blast at the will of the operator.



CONCRETE GRINDERS
SAWS
AIR TOOL ACCESSORIES

SUMP PUMPS
BACKFILL TAMPERS

ROCK DRILLS
PAVING BREAKERS
CLAY DIGGERS

For complete information and specifications on all Thor Air Tools for mining and construction, write today for Catalog 42-A.

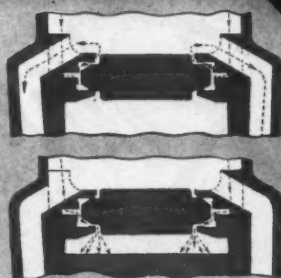
You Get in Thor

ROCK DRILLS

● Only the precisely-measured quantity of air required can enter the machine—controlled by precision ground tolerances within .0002" between the valve flange and chest shoulders.

● Excess air which overloads the drill and staggers the stroke is eliminated to *reduce vibration . . . to extend the life of all working parts!*

● Short-travel action reduces wear on the valve, which is heat-treated for durability and precision-ground for perfect fit—*extending the life of the valve itself!*



● All cuttings are blown free to keep the drill *cutting fresh* with every blow instead of pulverizing accumulated cuttings.

● Stalling is eliminated because the drill steel is kept free from cuttings. Drilling speed is retained at a *maximum* rate.

● The life of the steel itself is extended because cuttings can not jam around it. More holes drilled per steel . . . *less maintenance cost.*

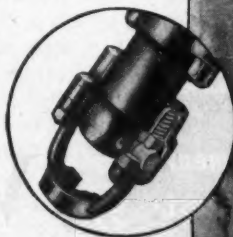


Automatic LUBRICATION

Built-in oil reservoirs distribute oil under high pressure to all operating parts each time the piston hammer delivers a blow—assuring smooth operation, longer life of all parts.

THOR SINKERS

ENCLOSED RETAINER SPRINGS—All Thor Sinker Rock Drills are equipped with the new Thor *spring-enclosing* steel retainer which protects the springs from dirt and prevents clogging . . . providing steady, quick functioning of the locking device for changing drill shanks. Sealed at proper tension inside a steel cap, the enclosed springs cannot be over-tightened . . . *always* work easily.



Thor

Portable Pneumatic and Electric Tools

INDEPENDENT PNEUMATIC TOOL COMPANY



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CLEVELAND
DETROIT
LOS ANGELES

Like automobile tires, mine locomotive wheels wear out. New wheels are hard to get, expensive, require critical steel.

"Retreading"... WITH STEEL



By welding layers of steel to the worn wheel, then machining this "retread" to the standard tire contour, badly worn locomotive tires—and axles too—can be reclaimed.

Wartime steel shortages, and the pressing need to keep equipment running, has greatly increased the need for this maintenance service.

Westinghouse District *Manufacturing & Repair** Plants in the nation's coal mining areas have more than doubled their facilities for handling this vital emergency service.

Every Westinghouse M & R Plant is a part of a nationwide service organization—with local branches as close as your telephone. Factory trained men, using factory methods and equipment, are ready to give you complete, dependable repair service on any type of electrical equipment.

J-90501A



When vital electrical equipment needs repair... phone the nearest office of Westinghouse Electric and Manufacturing Company for


Westinghouse
COMPLETE REPAIR SERVICE

*33 M & R PLANTS • • ONE NEAR YOU



3 ENGINEERING TECHNIQUES ARE ESSENTIAL

The skills of three separate engineering staffs determine the design of your U.S. Rubber Conveyor Belts.

For every conveyor belt must be individually engineered, if it is to prove satisfactory in all respects. The particular conditions under which it will operate must be known and considered.

The design and construction of a U. S. Rubber Conveyor Belt, therefore, is influenced from the time a mine or quarry is planned.

Long before we produce a belt for you, our engineers have held two vitally necessary consultations: one with your engineers *at the scene of service*; another with the makers of the mechanical conveyor equipment installed.

Only through such coordinated effort can a conveyor belt be properly designed and built. All three groups must make their technical contribution in developing belts that can be relied on for long, economical service.

SERVING THROUGH SCIENCE WITH



ENGINEERED RUBBER CONVEYOR BELTS

UNITED STATES RUBBER COMPANY

1230 SIXTH AVENUE • ROCKEFELLER CENTER • NEW YORK 20, N. Y. • In Canada: DOMINION RUBBER COMPANY, LTD.

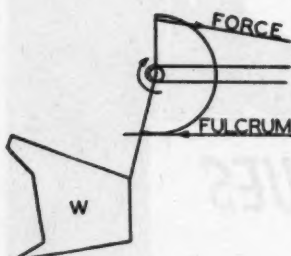
THE BITE DOES IT WHEN IT'S A "BIG BITE"!



MORE tonnage...that's what the "Big Bite" means. The loader with the "Big Bite," the GD-9, picks up more rock . . . loads the cars out faster . . . makes your manpower more effective . . . speeds up the entire drilling cycle . . . even in blocky ground.

For bigger tonnages...for lower operating costs, choose the loader with the "Big Bite": the GD-9.

HERE'S WHERE IT GETS THAT "BIG BITE"

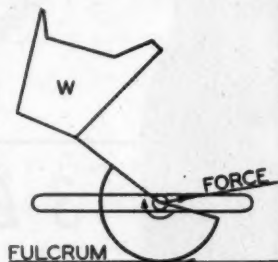


1. GREATER CROWD

At start of mucking cycle, force is applied to top of rocker, where it is needed for greater "crowding action" to get a "big bite." Small effective diameter of nearly empty winding reel adds power.

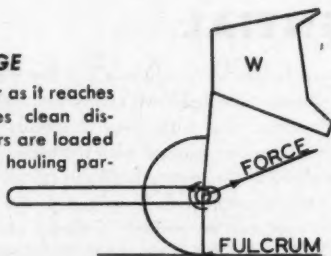
2. FASTER LIFT

Full dipper is raised clear of muck pile. Force is now applied to mid-point of rocker. This, plus the greater effective diameter of the full winding reel, increases speed of dipper as it nears discharge position.

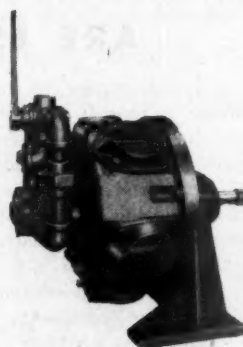


3. FASTER DISCHARGE

Maximum speed of dipper as it reaches discharge position assures clean discharge of entire load. Cars are loaded faster. No time is wasted hauling partially loaded cars.



For complete information on the mine car loaders with the "Big Bite," write for descriptive bulletins. Gardner-Denver Company, Quincy, Illinois.



4. MORE POWER

Two powerful five-cylinder radial air motors provide plenty of power to crowd into the muck pile and come up with a full-loaded dipper every time.

GARDNER-DENVER



Since 1859

GRINDING

ROLLING DOWN

Be prepared for postwar operations when one of the greatest problems of mill operators will be to reduce costs. Use the grinding balls that *grind twice as many tons per ball*. Use Moly-Cop Balls...they wear longer and wear evenly to keep their spherical shape, without flaking and spalling. You conserve steel, save power and recover more metal. Get started now to start the *right* ball grinding.

TRADEMARK REG.

MOLY-COP

COPPER-MOLYBDENUM-ALLOY

Grinding Balls

Already proved in superior efficiency and ultimate lower costs by mills throughout the United States and 14 other mining countries.



SHEFFIELD STEEL CORPORATION

KANSAS CITY 3, MISSOURI

Export Representatives

Canada—The Canada Ingot Iron Company, Ltd.,
Guelph, Ontario, Canada

All Other Countries—THE ARMCO INTERNATIONAL
CORPORATION, Middletown, Ohio



DEEP FREEZE

The Cruellest Arctic Winter couldn't duplicate the cold to which we subject "U.S." Royal Mining Machine and Locomotive Cables in the test we call "Deep Freeze". We push the thermometer down to -70° Fahrenheit...cold rarely experienced by mankind—and Royal Cords and Cables take it.

Yet the "Deep Freeze" test is only one of six such rugged tests. "U.S." Royal Cords and Cables are also tried by heat, impact, compression, stretch and bend ... so that when they go from us to you we know they're dependable in every way.

That is why mine operators and locomotive designers can specify "U.S." Royal Mining Machine and Locomotive Cables with absolute confidence whenever they want balanced construction, flexibility, high dielectric strength, smoothness of finish, and long trouble-free service.

THE NEW "U.S." ROYAL *Safety Tested*

MINING MACHINE AND LOCOMOTIVE CABLES



SERVING THROUGH SCIENCE

UNITED STATES RUBBER COMPANY

1230 Sixth Avenue • Rockefeller Center • New York 20, N. Y.
In Canada: Dominion Rubber Co., Ltd.



Magnesite ore was hauled three miles from quarry to reduction plant by fleet of 10 Cummins Diesel-powered Kenworths equipped with 10-yard dump bodies. Trucks handled 2,000 tons of ore per day, plus 500 tons of waste rock. They also hauled reject fines for road maintenance.



Delivered to the crusher, the process of reducing crude ore to magnesium oxide began. Processed material was trucked 343 miles to metalizing plant in 22 Kenworths powered with 200 hp., supercharged Cummins Diesels and equipped with semi- and full trailer of 15-ton capacity each. Gross weight of each of these units is 105,020 pounds.



Basic Magnesium's trucking operation, which was under contract to Wells Cargo, Inc., involved 180,000 ton-miles and 12,000 truck-miles a day. Originally handled by truck and rail over a roundabout route of 1,148 miles at a cost of \$8.25 per ton of oxide . . . the 22 Cummins-powered units, like that pictured at right, traveled a direct route of only 343 miles. Shipping cost was slashed to \$4.58 per ton . . . oxide loss in transit reduced from 6% to 1/4%.

CUMMINS DEPENDABLE DIESELS

Automotive Models: Designed for all types of heavy-duty trucks in either highway or off-the-highway service.

★ ★ ★

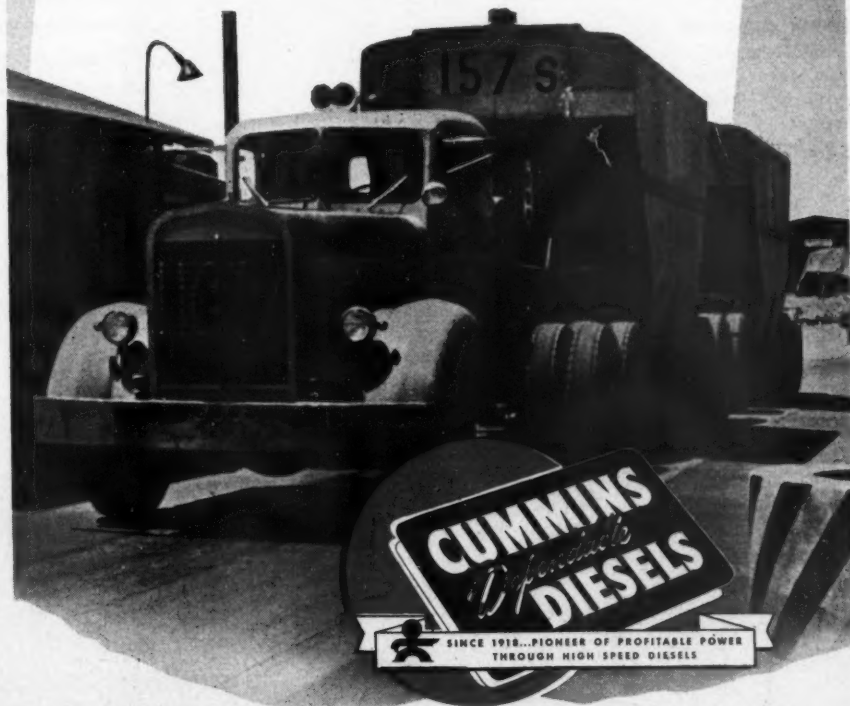
Industrial Models: Portable and stationary engines, power units, and generating sets for service in any industry requiring heavy-duty power.

★ ★ ★

Marine Models: Propulsion engines and marine type generating sets designed for all types of fishing boats, work boats, and pleasure craft.

If it's a Tough Job.... It's a Job for Cummins

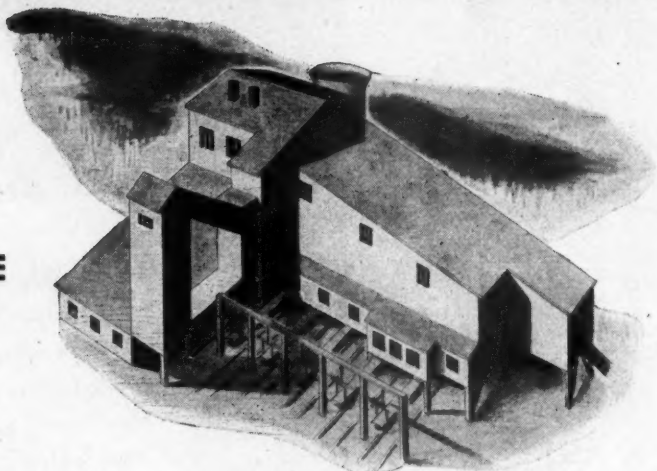
For Basic Magnesium, Cummins Diesel-powered Kenworth trucks did the entire haulage job in the production of all-important magnesium. Ten 15-ton units hauled 2,000 tons of crude ore to the ore reduction plant each day. Twenty-two double-bottom units, each with a payload capacity of 60,000 pounds, kept the magnesium oxide moving in a steady flow to the metalizing plant 343 miles away. Substitution of this 100% Cummins Diesel haul for the previous combination of truck and rail transport shortened the round trip distance by 1,610 miles . . . cut hauling cost by \$3.67 per ton . . . reduced material loss en route by 5 1/2%. Here, again, is proof that Cummins-powered trucks consistently move material—*cheap and fast*. Proof that, if yours is a *tough job* . . . it's a job for Cummins Dependable Diesels. CUMMINS ENGINE COMPANY, INC., Columbus, Indiana.



LET
WESTINGHOUSE PRESCRIBE

FOR YOUR

Coal preparation problems



Here's a dependable prescription for a healthy efficiency curve in your preparation plant—*Westinghouse electrical equipment*. You'll get factory-built and tested apparatus, specifically designed and engineered to give maximum efficiency under all operating conditions. Thanks to unit design, construction work will be reduced to a minimum. You'll have fewer engineering problems, too—the result of proper selection, based on the recommendations of Westinghouse engineers.

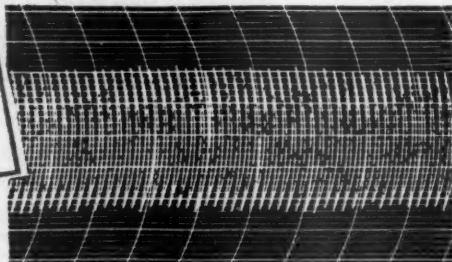
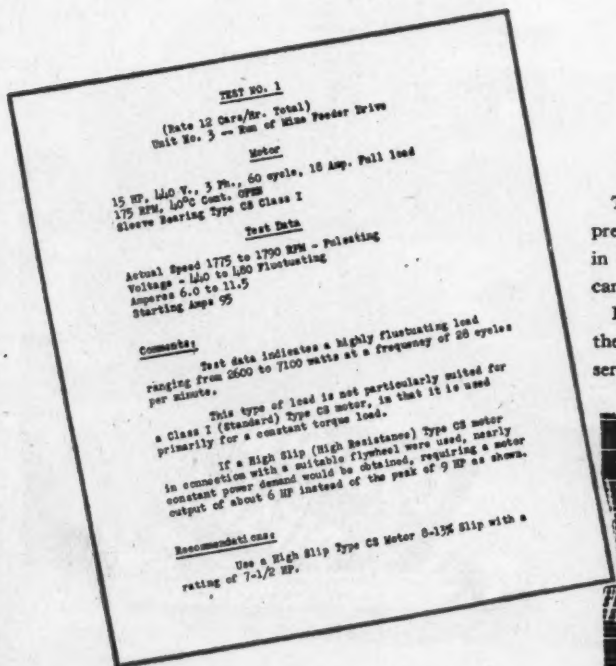
Equally important—responsibility for the proper functioning of your apparatus rests solely with *one* manufacturer. Westinghouse builds *all* the electrical and motive equipment needed to meet your complete requirements.

Westinghouse *alone* can offer you this undivided responsibility for the *design, manufacture, installation and performance* of your preparation plant electrical equipment. Westinghouse field service men are available to help you, and maintenance and repair shops are located conveniently throughout the mining districts. For complete information, call your nearest Westinghouse representative. Westinghouse Electric & Mfg. Co., P. O. Box 868, Pittsburgh 30, Pa.

WE KNOW THE PROBLEMS

To prescribe the correct solutions for the electrical problems of each preparation plant requires a specialist, trained by years of experience in solving similar problems. That's where Westinghouse engineers can help you.

For example, here's a typical actual problem—a motor drive—and the Westinghouse prescription, based on a field test by a Westinghouse service engineer.





MOTORS AND GEARMOTORS

Selection of the correct type and size for each individual function is important to successful over-all production. There's a Westinghouse motor and gearmotor to fit every application—and each conforms to the rigid Westinghouse specifications.



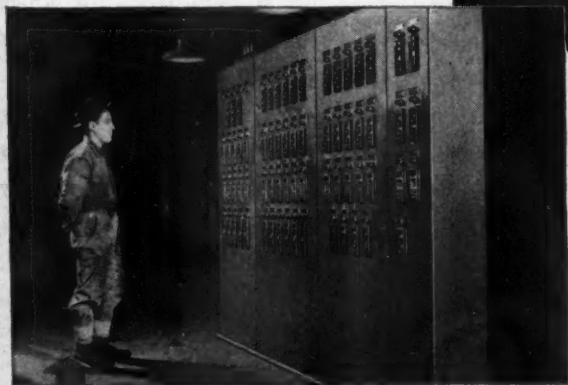
TRANSFORMERS—

The Type ASL Air-Cooled Transformer is particularly recommended for use in coal preparation plants. It is free of hazard to apparatus or workmen; no vault is required. Danger from fire or explosion is completely eliminated; no liquids of any kind are used. Air cooling by natural-draft circulation through the housing and coils insulates the low and high-voltage windings.



POWER CENTERS—Mounted in one complete factory-assembled unit, the Westinghouse Power Center consists of a high-voltage section, throat-connected through an ASL Transformer to a similar metal-clad, low-voltage Control Center, from which point power is distributed for the entire plant. Economy, safety, compactness and ease of installation, operation and maintenance are distinguishing characteristics.

J-94644



CONTROLS—Localizing of controls for the entire plant in a single, conveniently located push-button control station is an outstanding Westinghouse development for greater plant efficiency and safety. All push-button stations, indicating lights and transfer switches, are mounted on the front panel of a completely metal-clad enclosure. Vertical construction entirely eliminates the dust hazard always present with bench-type or angle mountings.

HERE ARE THE ANSWERS

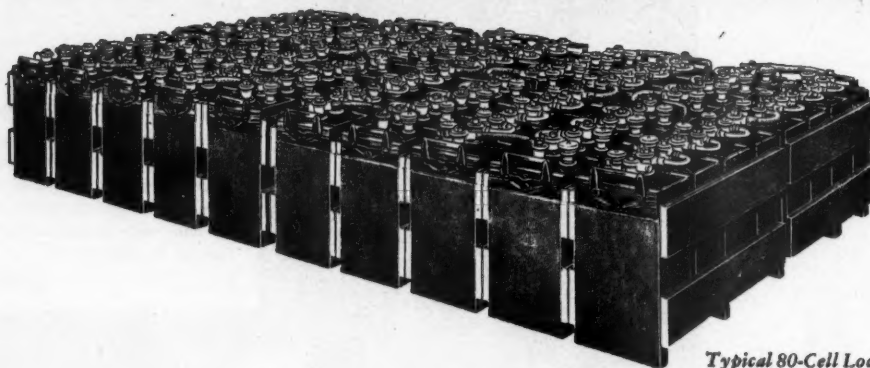
The electrical apparatus in your coal preparation plant is important. Upon it depends the efficient, economical operation of the entire plant. For complete assurance of dependable performance, specify Westinghouse for *all* your requirements.

The Westinghouse line is complete—when you buy Westinghouse, responsibility for the proper functioning of your electrical system rests with *one experienced manufacturer.*

Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

*Electrical Equipment
for the Mining Industry*



Typical 80-Cell Locomotive Battery

WHAT USERS DISCOVER

In Mine Locomotives and Shuttle Cars Alkaline Batteries Give You These Important Advantages

- They are **durable mechanically**; grids, containers and other structural parts of the cells are of steel; the alkaline electrolyte is a preservative of steel.
- They are **foolproof electrically**; are not injured by short circuiting, reverse charging, or similar accidents; are free from self-deteriorating reactions.
- They can be **charged rapidly**; do not require critical adjustment of charge rates; can be charged directly from mine d-c supply.
- They **withstand temperature extremes**; are free from freezing hazard; are easily ventilated for rapid cooling.
- They can **stand idle indefinitely** without injury, without attention, and without expense.
- They are **simple and easy to maintain**.



Ask a user of Edison Alkaline Batteries what he thinks of them as power units for locomotives and shuttle cars. The chances are he'll say they provide the closest approach to failure-free uninterrupted haulage power he knows of — and are economical, too.

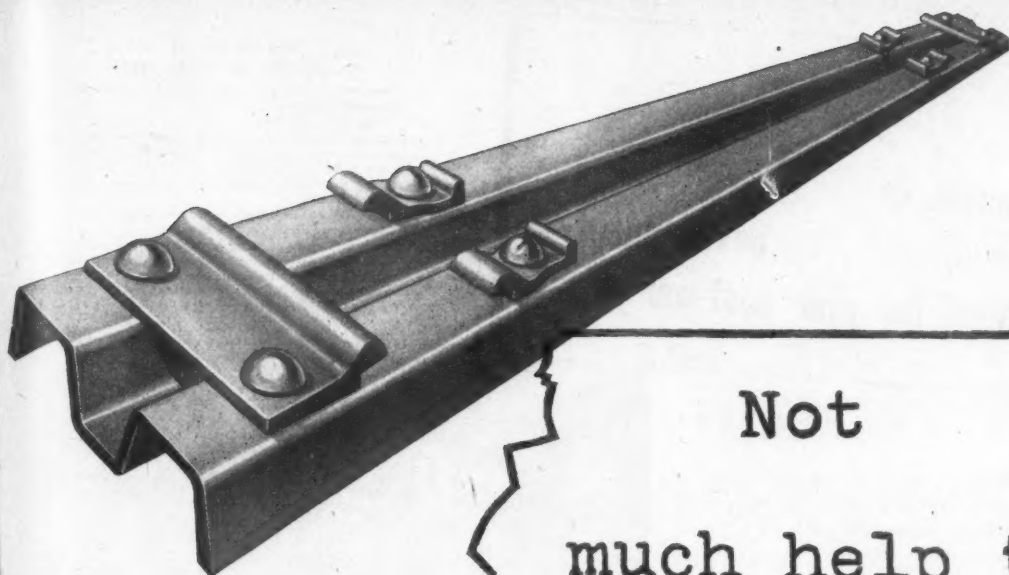
He may at some time have had a wreck — such as a locomotive falling into a shaft or rolling down the side of a waste dump — and found that the battery not only survived with little or no damage but later went on and delivered full service life.

Or, he may have discovered that he can use "worn-out" motive-power batteries for various kinds of lighter-duty standby work for which their capacity is still ample, and thus can get more years of dependable service from them.

As a matter of fact, it is only by actually using Edison Alkaline Batteries that a person finds out how dependable and economical they really are. *Edison Storage Battery Division of Thomas A. Edison, Incorporated, West Orange, N. J.*

Edison
ALKALINE BATTERIES

⊕ 6436



Not
much help to
the scrap pile



Scrap metal is precious today. But Bethlehem No. 5 Steel Ties are a long time getting into the junk heap. They last too long to help the scrap pile grow very fast.

The durability of No. 5's is best shown by their actual service records in mines. It isn't at all unusual for these ties to be installed, taken up, and reused as many as twenty-five times.

Steel ties in a room-track layout bear the full weight of massive cutters and loaders—and of heavily-laden cars in a seemingly endless procession. Many ties, after a limited term of service, are ready to call it quits. But Bethlehem's No. 5 is built to stay in there month after month, taking the cruelest sort of abuse, without buckling out of shape.

It's a tie that is designed specifically for 40-pound rail; for the crushing loads of modern mechanized equipment. A heavy-duty unit, it has the thickness, depth, and all-around strength required by today's exacting service conditions. Weighing five pounds per foot of section, it is nevertheless so easy to handle that track-laying becomes a simple operation—even for inexperienced crews.

The No. 5 retains all the best features of other Bethlehem ties, including strong, riveted clips that automatically gauge the track. You'll find it on the job, doing its vital but unspectacular work, long after several sets of wooden ties have been discarded. For fewer replacements... lower track-laying costs... genuine overall economy... specify Bethlehem No. 5's on your next 40-pound rail job.



Homocord construction in CONVEYOR BELTS -another MANHATTAN development- war-proved for your post-war use

Here is a totally different type of Strength Member construction — developed in time to speed war production and now improved with FLEXLASTICS* for post-war use.

Pre-war installations have been delivering high tonnage on a steady basis that is adding to MANHATTAN'S already distinguished achievements in conveyor belt service.

Homocord construction has been invented and perfected by MANHATTAN engineers particularly and only for conveyor belt use, and it is not designed for use in any other products. It is the first and only conveyor belt possessing the virtues of a cord belt, but with the drawbar strength and resistance to fatigue to hold metal fasteners. It marks a distinct milestone in conveyor belt progress.

Longitudinal Homocords are grouped to give great tension strength and tied together with cross Homocords which allow exceptional troughing for full loading of the belt, plus the strength to permit use of fasteners.

These component Strength Members are sealed-in to make a homogeneous, pliable belt which flexes easily around end pulleys. The Homocords, embedded in moisture-proof FLEXLASTICS* and mildew-proofed as additional protection, have a flexible, resilient, rolling contact with each other to provide cushioned resistance for heaviest feed impact.

These are significant advantages that will help you meet tomorrow's needs. They are worth investigating now.



*The term FLEXLASTICS is an exclusive MANHATTAN trade mark. Only MANHATTAN can make FLEXLASTICS.

KEEP AHEAD WITH



THE MANHATTAN RUBBER MANUFACTURING DIVISION

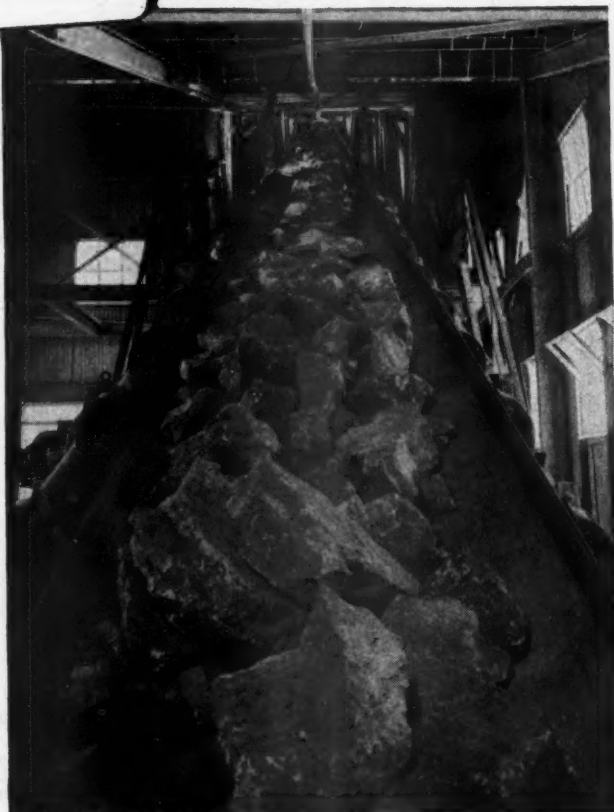
OF RAYBESTOS-MANHATTAN, INC.

EXECUTIVE OFFICES

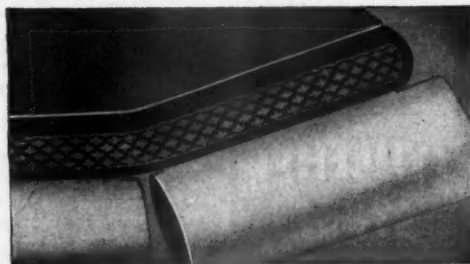
PASSAIC, NEW JERSEY

ADVANTAGES of HOMOCORD CONVEYOR BELTS

1. Complete bonding of every member into a homogeneous structure.
2. Holds metal fasteners.
3. Lateral flexibility permits perfect troughing, accurate training, reduces fatigue of flexing at bend in troughing idlers.
4. Resists destructive action of continuous or heavy impact feeding.
5. Cushion Homocord body and low inelastic stretch reduce wear and tear of top cover.
6. Homocord body reduces hazard of punctures.
7. Homocords so completely encased in Flexlastics, moisture not admitted, mildew cannot start. Manhattan Conveyor belts mildew-proofed throughout.
8. Longer life, lower cost per ton.



Homocord Conveyor handling unusually large pieces of limestone.

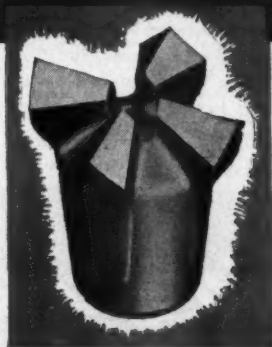


Detail of Homocord Strength Member construction. Note how open fabric structure permits rubber to penetrate and unite all parts into a homogeneous whole.

The Face

THAT HELPED LAUNCH
A THOUSAND SHIPS

I-R *Open-face* JACKBIT



Ingersoll-Rand has many designs of special bits which have been developed to meet certain specific rock conditions. The open-face Jackbit is one of these. It is becoming more and more popular with mining men who have friable, ravelly, vuggy ground to drill. Users of these open-face Jackbits have found that under these difficult drilling conditions, drilling speed is increased as much as 30% over standard bit designs. Features of this bit are as follows:

1. Raised cutting edges and deep clearances.
2. Recessed center hole.
3. Non-rifling characteristics.
4. Patented shape for easy reconditioning.
5. More usages.

These advantages of open-face Jackbits are enabling mining men to turn out the many kinds of ore necessary to build up our Navy and Merchant Marine. Here, indeed, is a face that is helping launch thousands of ships. Ask your nearest Ingersoll-Rand service branch for full particulars.

Ingersoll-Rand

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COMPRESSORS • TURBO BLOWERS • ROCK DRILLS • AIR TOOLS • CENTRIFUGAL PUMPS • CONDENSERS • OIL AND GAS ENGINES

IS YOUR HAULAGEWAY A BOTTLENECK... OR AN OPEN HIGHWAY?

Keep Tonnage Moving Swiftly from Face to Tipple by Operating Modern, Large-Capacity, All Steel Cars Equipped with O-B AUTOMATIC COUPLERS

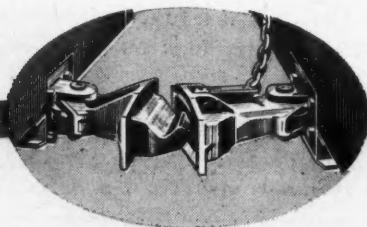
● Extra face output must reach the tippie before it can rightfully be called "increased production". Your haulage system can help by keeping pace with your loaders—or it can lag behind causing a bottleneck in tonnage flow. Keep your haulage capacity in balance with face output by operating modern, large capacity mine cars—and equipping them with O-B Automatic Couplers for greater handling speed, greater personal safety. Make it a point to discuss modern, automatic-couplered mine haulage with your O-B representative at the earliest opportunity.

1. More tonnage with fewer cars—extra capacity means fewer cars to do the same job.

2. Faster car handling, greater haulage speeds—fewer car changes under the loader with large-capacity cars. Rigid couplered connections buffered by rubber draft gears, permit faster haulage speeds with less chance of derailment or coal spillage.

3. Lower maintenance—All steel construction, anti-friction bearings and rubber draft gear keep cars out of the repair shop—on the job hauling coal for you.

4. Greater personal safety—No need for workmen to enter "Danger Zone" between cars. Cars couple automatically, upon impact—uncouple with the flip of a lever safely located on outside of car. Fewer lost-time accidents mean more production.



Ohio Brass

MANSFIELD, OHIO

Canadian Ohio Brass Co., Ltd., Niagara Falls, Ont.

KEEP BUYING WAR BONDS

Mining

CONGRESS JOURNAL

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How to Develop Safe Workmen

WE were pleased as punch the other day in Charleston, W. Va., to listen to N. A. Elmslie's "Observations on the Safety Movement." Being right up one of our favorite alleys, we saw in his realistic comments what we have long thought must sooner or later become the pattern for maximum elimination of mine accidents.

"Rules are crutches on which we lean" and they tend to destroy or curb great natural and essential self-protecting qualities in a man. With an overabundance of rules on the job, the workman parts too much with the need of looking out for himself. He may observe every one of the safe practices advised in the rule book and yet find himself totally incapable of coping with an unexpected situation. His native self-reliance should not be allowed to decline.

Now, rules do have an important function. They protect the mine operator in event of accident (through obvious rule violation) and serve to show that he has done all humanly possible to anticipate hazardous situations. In courts of law this is essential and is as it should be. But, mines with the biggest lists of safety rules sometimes have the most alarming accident records!

A. H. Zeilinger, page 19, stresses careful basic training as the essential thing. We add, let training point not merely toward abiding by certain set rules but also toward a thorough understanding of the thought back of the rules—a man may go on from this point to become a top-rate, alert, clear-thinking and accident-avoiding miner on his own hook.

A man's safety training shouldn't begin on the day he enters the mine—it should have begun years earlier. We like to reiterate our opinion that the proper start in safety lies well down in the formative years of childhood. We maintain that if schools and parents do their proper best in teaching self-reliance and alertness to Young America (even to setting up accredited courses of safety "like Algebra"), industry of the future will operate upon an unprecedented accident-free basis. Here's a surety bond for the future from which our inheritors can draw the dividends of ever-increasing security, which we can and should establish to earn their eternal gratitude.

"Full and Fair Disclosure"

"AN ACT: to Provide full and fair disclosure of the character of the securities sold in interstate and foreign commerce and through the mails, and to prevent frauds in the sale thereof, and for other purposes." Thus the "Securities Act of 1933" has sought to protect a credulous and often avaricious investing public from the professional sharpers. Prior to the passage of this law, it was easy for unprincipled stock promoters to work off great volumes of worthless stocks on the gullible.

The Securities Act, as intended, has eliminated the unscrupulous stock peddler—and we are well rid of him, as we have never been disposed to protect or even to countenance his kind. However, it has also had its unfortunate effects; and a large number of potential small new mines lie in enforced idleness for want of primary financing, because among other things the stringent requirements of the SEC call for the virtual condemnation of such ventures by elaborating on the risks involved on the very front page of the prospectus. From the beginning, the industry has insisted that the provisions of the Act and its administration are badly in need of liberalization.

We all know that without expending sizeable sums of money, "full and fair disclosure" of an ore body is virtually impossible, to say nothing of financing the actual mining operations. It follows that "full and fair disclosure" of the character of the securities themselves must reveal the "chance taking" element which characterizes the beginning of all mines. This is the very essence and romance of mining but we see no reason for going so far as to hang up a "Keep Out" sign. Unless a prospect owner can obtain private financing, he must fold up—and usually does—for fear of inadvertent or unintentional violation of the extremely rigid requirements under the law. In an effort to arrest a malpractice we have dried up the source from which have sprung the great mines of the West.

The National Small Mines Finance Conference just held in Butte in an attempt to correct this thoroughly bad situation has come forth with definite suggestions for relief. The Conference brought together a pretty thorough representation of all parties interested in determining the measures necessary for modification of those S.E.C. and State regulations which cover the sale of mining securities to the public. The understanding and cooperative spirit apparently developed was most heartening.

It is to be hoped that at long last the way is opening for the rejuvenation of the wilted confidence of those wishing to develop new mines—and that thousands of small mines and prospects now gasping for breath may soon experience much needed resuscitation. This re-opening of the avenue which has led to the great mines of the past and present can lead us now to new sources of mineral production as well as to broad and important fields of post-war employment and prosperity.



Some operators have found meetings between foremen and safety director of great help in building up a good training program



By A. H. ZEILINGER
Safety Engineer
Colorado Fuel & Iron Corporation

Job and Safety Training for New Employes

Modern Mine Foremanship Demands a Real Ability
to Train and Instruct. Herewith a Basic Analysis of
This Phase of the Supervisor's Work

AT THE beginning of the present war nationals from all over the earth were making their way homeward. Most of this traffic was by ship and on this particular liner were an Englishman, an Italian, a Frenchman, and a German. Before the ship reached its destination a lurking enemy submarine caught sight of it and sent a torpedo crashing into its hull. The captain quickly sized up the situation and then called all the

men passengers on deck. Said he, "We have life boat capacity for all but three. The rules of the sea provide that women and children must be cared for first. That means that three of you men must try to swim to safety so I assembled you here to ask for three volunteers." The Englishman stepped forward, exclaimed, "God save the King," and plunged into the ocean. Next the Frenchman stepped forward, shouted, "Long Live France," and he plunged in. Then the German stepped forward, raised his arm in a stiff Nazi salute, yelled,

"Heil, Hitler," and then pushed the Italian in.

I do not know who pushed me into this program but I do want to say that I am always happy to be pushed in where miners are for I invariably find a bunch of good fellows.

Mining—a Vital Industry, Requiring Well-trained Men

Since my remarks are directed to mining session, I desire to say a word about mining in general before proceeding with the discussion on Job and Safety Instruction. Mining is

Presented to the National Safety Council,
Coal Mining Section, Chicago, October 4,
1944.

not only very important in the United States but it is vital to the well being of our very nation. Without it many of the comforts of modern civilization would cease to exist and our highly vaunted place in the manufacturing world would become very inconspicuous indeed.

Since the mining industry has such an important role, one would naturally expect to find highly adequate facilities for preparing a well trained personnel among the many other creditable features which the mining industry possesses; but, unfortunately we often find the working force composed all too largely, of incompletely trained and only partially experienced miners. Of course the industry has a highly skilled technical force but I am speaking of mining, and particularly coal mining, at the worker level. The above condition is not the result of indifference, by any means. It's the effect of other causes. However, the condition indicated is very much in the accident picture and any sincere attempt to reduce accidents can well afford to make full use of a good training program, not only for the new employes but also for the older ones who may be put on work that is new to them.

Perhaps interest in training of any kind is lacking, unless there is a visible need for training. To ascertain if such need exists, suppose a check is made of the following points: turnover, leaves, performance, present work-load and the future work-load. Military requirements, men migrating to other industrial jobs, vacation needs and upgrading may be items sufficient to bring about considerable need for training of new men. Then too, there may be a need for better performance. Arrears in present schedules, or heavier schedules coming up for the future may also present a need for training. At any rate, if these angles are carefully checked, it is easier to spot needs if any there be.

Safety Instruction is Inseparable from Job Instruction

The task assigned to me is to be spent in discussing the subject, "Job and Safety Instruction for New Employees." I am glad that both Job Instruction and Safety Instruction are included, for the two are inseparable. The instruction of the new employee should begin before the employee actually goes to work. There should be an induction service which provides that the employment office, the safety office, or the department head explain the opportunity that the new employee is about to accept, the position of the company on safety, industrial relations, quality of work, chances for advancement, medical facilities, and so on. The new employee should be welcomed into the company family as a member of it. Remember, first impressions are lasting ones.

As the new employee is turned over to the superintendent or foreman it would be a fine thing for that superintendent or foreman to take at least a few minutes to welcome him, explain the nature of the work, the type of men he'll work with, the willingness of the company to cooperate and what is expected of him. Later he should be carefully instructed in his work and in the safe way of doing it.

With labor turnover at the present level, the demand for good instruction is greater than ever. At this point we inquire, "who is going to be responsible for the instruction of the new employes—who shall do it?"

Long ago, not only mining, but all industry woke up to the realization that today's foreman, if worthy of the name, must be an instructor as well as a leader. The day of the foreman who cracks the whip over his men or merely stands guard over them is gone, and gone forever. Good foremanship requires that the foreman be a good instructor. I am not unmindful of the fact that many experienced employes are used to train the new employes, so what I say about instruction or training goes for anyone who may have the training responsibility.

Mr. Thomas J. Watson, president of International Business Machines, is credited with the statement: "Knowledge creates enthusiasm and enthusiasm inspires us to work and move forward." The results of good instruction and training are practically limitless.

The "Training Within Industry" Plan

Perhaps at this point one might ask how a person can be a good instructor. I know of no better way to accomplish this than by the proper use of the four-step plan that the "Training Within Industry" set-up has offered us. Let's take a look at that plan and discuss effective ways in which to use it.

Going back to Mr. Watson's statement we pick up just one word—"Enthusiasm." Perhaps all of you have enjoyed hearing Harry Lauder sing at some time or other. Perhaps you all knew that he was not a great singer. Then why did you like to hear him sing? Well, I'll tell you—

It's because he put *enthusiasm* into his singing. His whole value as a singer was based on that one fact. Now any instructor, whether he be foreman or workman, will function in pretty much the same way. He must put enthusiasm into his instruction if he ever hopes to be effective. Of course, he also needs patience, sympathy and understanding. Assuming that these virtues are possessed, we're ready to discuss a splendid plan of instruction although you will all recognize it as not being new. You have all seen it but let's go over it and discover if we can find the best way in which to apply it.



New men on the job need all the helpful instruction they can get

The Four Steps

This plan is made up of four main steps—PREPARATION, PRESENTATION, PERFORMANCE and FOLLOW UP. The first step is to put the learner in the right frame of mind; the second is to be sure the learner will know; the third is to be sure the instructor knows that the learner knows; and the fourth step is to be sure the learner keeps using what he's been given and doesn't drop off

into some other less desirable method.

In order to get the new employee in the right frame of mind the instructor must do several things. He must put him at ease so he won't be under strain, question him to learn his experience, his knowledge and his background that he may determine a good starting place, get him *interested*; in other words he must *sell* him on the job (there's no use going any further if a failure is registered at this point), and then he must position him so that he's looking at the job in the same light as the instructor is.

In step two the instructor presents the operation or job. He *tells* the new employee, *shows* him, illustrates or demonstrates one *important* step at a time. He does it slowly, carefully, and patiently, stressing each *key point* (and here's where the safety instruction comes in. It will be explained more fully later.) The instruction must be clear, complete, and should cover only as much as the learner can master.

Next is step three where the learner performs. The instructor has him do the job while the instructor corrects errors and commends. As the learner

is doing the job the instructor has him explain each *key point*. To make sure he understands, questions such as, how? what? why? when? who? are asked. This type of question is used so that the learner can't answer just yes or no. The instructor should have the learner repeat until he knows that the learner knows.

In step four the learner is put on his own. With a few words of confidence from the instructor, he is told where he can get help if needed and also told that the instructor will be back to visit him later. Questions should be encouraged and frequent checks made and then tapered off as the worker goes ahead with the job. No instructor is worthy of the title if he doesn't remember this simple truth: "If the worker hasn't learned, the instructor hasn't taught."

Breakdown of Instruction Technique

To do a good job of instructing the instructor must make himself ready. He must have:

1. A time table. This shows how much skill is expected and by what date.
2. A breakdown of the job. This must list important steps and key points. (Don't forget that safety is always a key point.)
3. Everything ready. Tools, equipment, materials, and supplies.
4. Work place properly arranged. Just as the worker is expected to keep it. If these things are

done well the instructor is truly ready.

In the past, management depended upon "On the Job Learning." Today management demands "On the Job Training." Here's the difference:

ON-THE-JOB LEARNING:

Management hopes the worker learns.

Responsibility—the worker's.

Method used:

1. By guess and by gosh.
2. By hit and miss.
3. Catch as catch can.

Motto:

If the worker hasn't learned he was "too darn dumb."

ON-THE-JOB TRAINING:

Management demands the worker be trained.

Responsibility—the supervisor's.

Method used:

1. Plan—Time table.
2. Organize—Break down.
3. Put across—4 step plan.

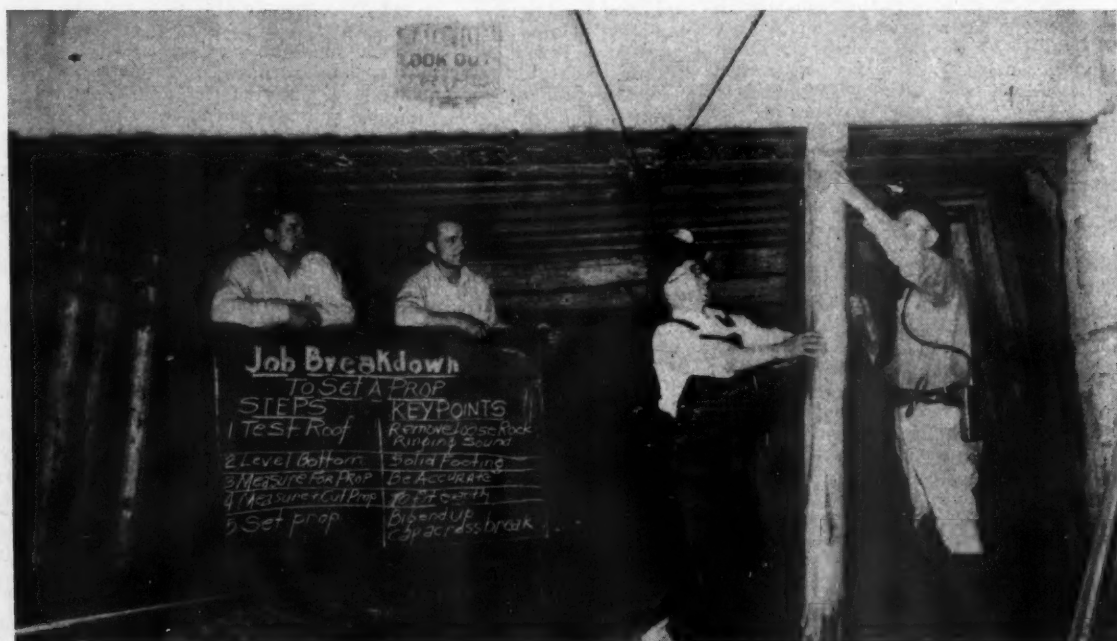
Motto:

If the worker hasn't learned the instructor hasn't taught.

Perhaps at this point you'll say: "Alright, it sounds good but how are we going to use that to train men to do a mining job and do it safely?" We are happy to have that question. Let's go back to step number two where the instructor gets ready to instruct. That is where he must have a breakdown of the job. The breakdown consists of listing each *important step* and each *key point*. Don't forget that safety is always a key point. The instructor not only *instructs* the learner in these key points, but they are earnestly *stressed*. What is a key point? A key point is anything that will make or break the job, make the job safer,

the job. Then list each important step. Oh yes, we must know what an important step is. It is one that advances the work toward the desired goal. It is any action, motion, or operation that will advance the work. We explained a key point above so now we are ready. We'll take a very simple job like making a prop, the steps and key points of which appear in the box on the next page.

In the same careful manner, the foreman should instruct the new employee relative to his work area, the machines, tools, materials, clothing, methods used, and cooperation with the other workers. Now, to determine



Even the simplest tasks should be explained carefully, with full recognition of every possible consideration for the avoidance of accidents

JOB—MAKING A PROP

Important Steps

1. Select timber.
2. Place selected timber in proper position to be cut.
3. Brace timber for cutting.
4. Square butt if not already square.
5. Mark to proper length.
6. Saw to proper length.

Key Points

1. Timber must be sound and proper size.
2. Use supporting timbers. Have axe sharp. Set axe firmly with a fair blow.
3. See that timber does not loosen axe. Timber must be held firmly.
4. Have a sharp saw. Keep hands away from teeth in starting cut. Start cut on back stroke. Make a square cut.
5. Allow for cap and wedge.
6. Keep hands away from saw teeth in starting cut. Start cut on back stroke.

Instruct slowly, one important step at a time and stress the key points. Remember, as always, that safety is a key point.

the job hazards and to correct them in the most effective way, it will be necessary for the foreman to:

1. Break down the jobs and get all the facts.

2. Question thoroughly, weigh and decide if a hazard exists.
3. Develop best procedures and then act to eliminate the hazard.
4. Check to see that the hazard is kept eliminated and keep on

looking for further hazards and ways to eliminate them.

In checking the work area, machines, tools, clothing, and work, you may be surprised at how many hazards will be found. There are three ways to deal with them. *Remove them if possible; if not possible to remove them, then guard them; and if that is not possible, train the worker in safe practices in doing the job.*

You foremen may say, "Well, that's a big job." Yes, it's a job alright. But after all, you were asking for a job or at least that's what you accepted when you agreed to become a foreman. So now that you are a foreman, be a good foreman and to do that you'll have to accept the responsibility of being a good instructor. Remember that instruction jobs, like other jobs, when half done get only half results and if you compromise you're yielding. The thought of this little verse may help at such a point:

"From compromise and things half done,
Keep me with a stern and stubborn pride;
And when at last the victory's won,
O God, keep me still unsatisfied."

For a Happier Christmas—Avoid Accidents!

The National Safety Council makes an appeal in announcing a nationwide campaign to reduce the huge accident toll that annually mars the Christmas holiday season

By NED H. DEARBORN

President
National Safety Council

IT is a simple fact that this is not going to be a Merry Christmas for a lot of people. There are few homes in America that have not felt the touch of war in one way or another. This cannot be helped. But we can help to prevent holiday accidents that also bring tragedy and each year make a mockery of Christmas in thousands of American homes. An accident that brings death or suffering into the home at Christmastime is a sure way to remove the last vestige of the holiday spirit. It is a sure way to ruin Christmas completely for that boy in uniform who is fighting to insure for his family the very security and happiness an accident destroys. The least we can do on the home front is to go to a little extra trouble to prevent these accidents that make things tougher for the boy on the battlefield.

There is a lot of difference between the risks a fighting man must take and those we thoughtlessly invite. His risks may shorten the war. Ours may prolong it. Deaths from accidents on the home front since Pearl Harbor still are running more than two to one over deaths to American fighting men on all battlefronts. The death totals on November 1 were 280,000 for accidents and 108,897 for war. No one means to imply, of course, that life on the home front is as dangerous as on the battlefield. But as long as accidents are making a second-place killer out of war, they are a challenge no serious-minded person can ignore. The Council's records show that accidents killed 9,150 persons last December—the biggest toll for any month in 1943. Christmas holiday accidents contributed heavily to this toll.

One hundred and thirty other national organizations are cooperating with the Council this year in the Christmas safety campaign. Governors, mayors, police chiefs, state patrol chiefs, motor vehicle administrators and other public officials and safety leaders are participating actively. But success of the campaign rests in the final analysis with the private citizen—the G. I. Joe of the home front, who drives a car, works in a factory or office and otherwise lives the life of an average American.

It is our conviction that once this fellow realizes that accidents waste power Uncle Sam needs for the knock-out blow against the enemy, he will get in there and pitch to help prevent these accidents. If he does, we can cut this Christmas accident toll in half, make things a little easier for the boys in uniform and bring them back a little sooner. Isn't it worth it?



Prospecting Trenching With Angledozers

Mechanized dirt-moving equipment has greatly increased the scope of prospect trenching by lowering the costs and increasing the speed of such work. Where the soil covering was more than 3 or 4 ft. deep, operators were quickly discouraged and abandoned surface exploration in favor of shaft sinking, drifting, or diamond drilling; wildcat trenching was seldom undertaken, even where the soil covering was thin. Although power shovels, trench diggers, and draglines are useful under special conditions, crawler-mounted angledozers will usually do the same type of work and have a far wider range of adaptability. They are therefore incomparably the most generally useful equipment for the purpose.

SINCE 1939 the Bureau of Mines has been engaged in a widespread search for minerals useful to the war program; this work required a great deal of pioneer exploration in areas where known outcrops were marginal or sub-commercial by pre-war standards. Engineers in charge of field operations were quick to perceive the applicability of mechanized trenching on a fairly large scale, particularly in the Northwestern States, where completely exposed vein-outcrops are rare. Probably no other organization to date has done a comparable amount of angledozer prospect trenching under such a wide range of conditions. The following comments and accompanying cost tables are based on work performed chiefly in Idaho, under a variety of physical and climatic conditions. The most important applications of the angledozer for such work may be described under three heads:

(1) Quick and cheap preliminary exploration of prospects for which the surface exposures are good enough to arouse some interest but which do not warrant diamond drilling or other form of underground exploration. Very frequently a few hours or a few days of work with an angledozer will either eliminate the need for further consideration or justify a more expensive program.

(2) Tracing of veins or other ore structures as a guide to underground exploration.

(3) Trenching of areas in which there is good reason to suspect the existence of ore, but in which there are no outcrops.

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By S. H. LORAIN

District Engineer
Western Region, Bureau of Mines
Moscow, Idaho

The value and scope of this work may be illustrated most clearly by a few specific examples. The job references are to the job numbers given in the cost tables accompanying this article.

Jobs 1 and 2 were undertaken to investigate a few outcrops of stibnite-bearing quartz veins on a grass- and brush-covered hilltop. Several caved prospect pits and a few short adits, driven many years before, had failed to prove continuity between the outcrops. The results of the first few days of trenching were encouraging. Approximately 3,500 lin. ft. of trench-

ing, at a direct cost of less than \$1,000, resulted in proving one 500-ft. ore shoot and several shorter ore shoots along a 2,000-ft. zone. Within a few months the owner was shipping high-grade antimony ore. Shipments continued for several years during the period when antimony was considered "strategic."

Job 3 was undertaken to determine the extent and value of a deposit of disseminated antimony ore, which had been exposed by erosion at only one point. The surrounding surface was soil-covered, and the underlying rocks were decomposed for 10 to 20 ft. below



Bird's-eye view of trenches on high timbered ridges (El. 7,000-8,000 ft.), East Central Idaho. This work led to discovery of a large deposit of cobalt-copper ore

the surface. A deep sidehill cut was required to reach unoxidized ore. The showing made warranted drilling, which ultimately led to discovery of a large body of high-grade tungsten-antimony ore.

The first part of Job 7 consisted of trenching for the projected extension of a lode of cobalt-copper ore, which had been partly explored by underground workings. The first results were discouraging; but a little wildcatting made possible by the equipment led to the discovery of a much larger, parallel lode, on which some diamond drilling was believed to be warranted. The drilling in turn resulted in the discovery of a third lode, which proved of commercial importance.

Large Scale Trenching Combined With Drilling Solves a Special Problem

Other evidences of similar mineralization existed over several square miles; but the surface was entirely covered with three to ten feet of soil and a heavy stand of lodgepole pine. Outcrops were practically nonexistent, and the ore was oxidized so deeply that subsurface exploration was necessary to determine metal content. Thorough exploration by drilling would have entailed prohibitive costs. Consequently, large-scale trenching operations were carried on coincidentally with drilling. The purpose of this trenching was, first, to eliminate as much weakly mineralized area as possible and, second, to permit wider spacing of drill holes in the most favorable areas. By trenching to expose the strong gossan ahead of drilling operations, it was possible to locate holes to the best advantage and, at the same time, to obtain visual evidence of the continuity of the ore structure between rather widely-spaced drill holes. This resulted in a great saving of high-cost drill footage while permitting a fairly reliable preliminary estimate of ore tonnage.

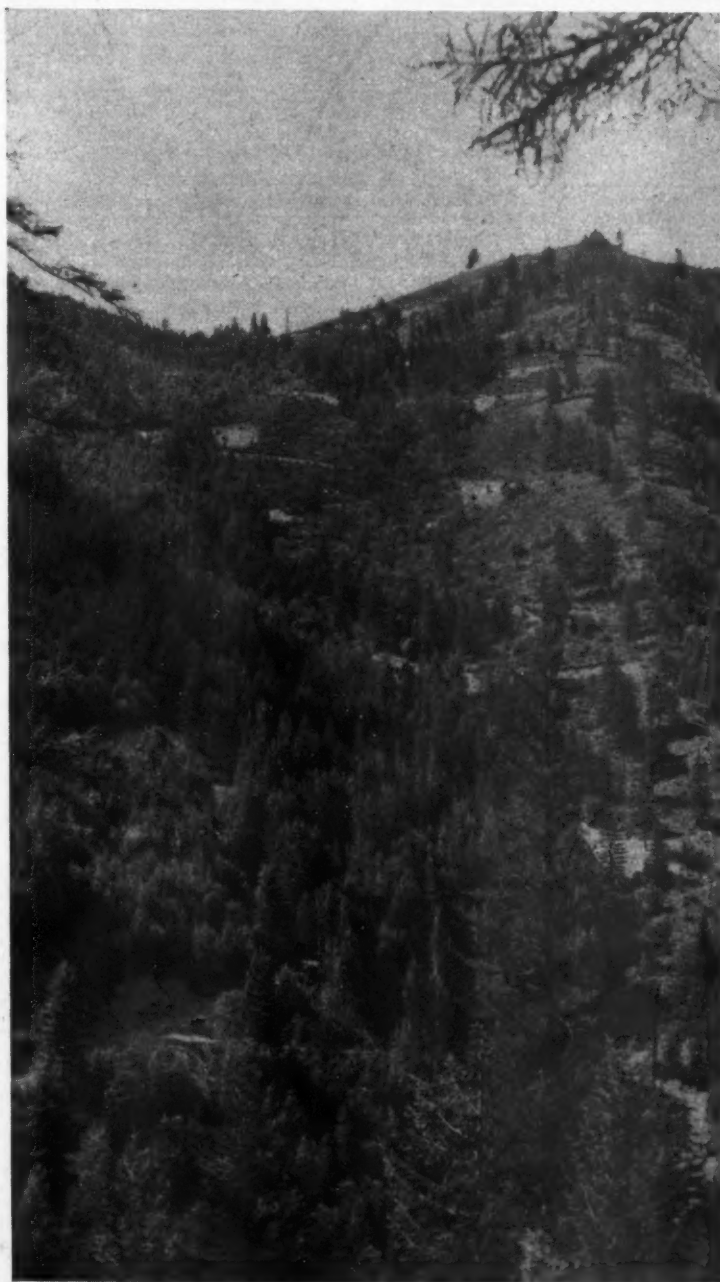
Jobs 8 and 9 were essentially wildcatting operations to disclose mica-bearing pegmatites in a brush- and tree-covered area of one to two square miles, where valuable deposits of mica had been discovered at several widely separated points. The erratic habits of pegmatites nullified any attempts at systematic planning. Nevertheless, it was possible to track down a number of hitherto unknown mica pegmatites. Several contained mica ore shoots of commercial importance. The first ore shoot found is producing mica, and exploration is still in progress.

The other jobs listed were similar to one or another of those that have been described. No. 4 exposed a small tonnage of marginal-grade tungsten ore; No. 5 resulted in discovery of a

small but high-grade copper ore shoot, which was immediately mined; and No. 6 gave positive information that will be useful in planning drill operations during the coming season.

The experience gained in this work permits several statements to be made regarding the most efficient selection and use of equipment. For work of this nature, no decided preference was formed for any make of machine; the condition of the equipment and the

ability of the operator are much more important. Under most conditions, a heavy machine is cheaper than a light one. This is well-illustrated by Jobs 1 and 2, where the lighter machine, at a lower rental rate, cost nearly twice as much per cubic yard under identical conditions (Table 4); the difference would have been greater in heavy brush or in timber. Jobs 8 and 9 gave nearly the same cost per yard for a heavy and a light



Trench system following projected ore structure down ravine in Coeur d'Alene district. Exposed outcrops led to two high grade zinc-lead ore shoots. Trenches later used as roads to move in drilling equipment

machine on the same project; however, the heavy machine was used to clear the way through brush and timber while the lighter machine was used chiefly for clean-up work. In very rough country the heavier machines, with more power, can climb hills where a lower-powered machine cannot follow.

Under most conditions the hydraulic-operated blade is better for prospect trenching than the cable-operated blade. Although many general contractors prefer the cable-operated blade because of mechanical simplicity, the hydraulic blade control provides the power needed for positive digging into the trench bottom.

TABLE 1—EQUIPMENT AND RENTAL

Job No.	Make	Model	Approx. drawbar hp. rating	Type blade control	Rental basis	Rental rate ¹ per hr.
1	International	TD-40	33-45	Hydraulic	Fully operated	\$4.50
2	Caterpillar	D-2	25	do	do	2.25
3	International	TD-40	33-45	do	do	4.50
4	Caterpillar	D-7	80	Cable	Machine only	5.00
5	Allis Chalmers	K.O	54	Hydraulic	do	6.00
6	Allis Chalmers	S.O	87	Hydraulic	Fully operated	5.00
6	Cletrac ²	(1935)	55	do	Machine only	4.00
7	Caterpillar	D-6	55	do	do	2.93 ³
8	Allis Chalmers ⁴	HD-7	60	do	Fully operated	6.50
9	Caterpillar	40	40	Cable	Machine only	4.43

¹ Rental includes repair maintenance. In most cases rental is per hour of actual operation.

² Gasoline powered.

³ At flat rate per month.

⁴ Equipped with winch.

TABLE 2—JOB DESCRIPTION

Job No.	Linear feet trenched	Cu. yds. moved	Classification of material—cu. yd.			Vegetation	Hand clearing, sq. ft.	Average cross section, ft., depth x width
			Alluvium	Loose rocks and soil	Rock in place			
1	1,800	3,600	3,600	....	....	Chiefly grass and sparse brush	0	4.5 x 12
2	1,730	3,460	3,940	....	....	do	0	6 x 10
3	600	9,500	6,900	....	2,600 ¹	Medium timber	18,000	21 x 45 ²
4	8,300	8,300	7,800	500	....	Grass	0	2.25 x 12
5	2,045	6,420	5,020	1,400 ³	....	Heavy brush and scattered trees	0	6.5 x 13.0
6	3,305	6,600	4,100	2,500	....	Chiefly grass and small trees	0	9 x 12 ³
7	9,552	50,800	37,900	10,400	2,500	Dense lodgepole pine	0	11.0 x 25 ³
8	11,390	14,800	....	9,300	5,500	Dense brush and scattered trees	0	3.5 x 10
9	7,200	9,300	....	5,900	3,400	do	0	3.5 x 10
Totals	45,922	113,260	69,260	30,000	14,000			

¹ 350 cu. yd. required rock drills; remainder drilled with specially designed hand augers.

² Numerous granite boulders weighing 1 ton or more.

³ Side-hill cut. Depth given for up-hill slope.

TABLE 3—OPERATING COST IN UNITS OF EQUIPMENT HOURS, LABOR AND SUPPLIES

Job No.	Angledozer hours				Fuel and Oil										Man-hours		
	Per lin. ft.	Per cu. yd.	Total	Lin. ft. per hour	Cu. yd. per hour	Gal. Diesel oil			Gal. gas.			Gal. lube oil			Per lin. ft.	Per cu. yd.	Total
						Per lin. ft.	Per cu. yd.	Total	Per lin. ft.	Per cu. yd.	Total	Per lin. ft.	Per cu. yd.	Total			
1	0.027	0.013	48	37.5	75.0	....	....	....	....	....	....	....	....	....	0.053	0.027	96
2	.081	.035	140	12.3	28.0	....	....	....	....	....	....	....	....	....	.106	.046	183
3	.297	.016	178	3.4	63.3	....	....	....	....	....	....	....	....	....	2.738	.147	1,657
4	.017	.017	142	58.7	58.7	....	....	....	....	....	....	....	....	....	.017	.017	142
5	.100	.031	200	10.0	32.1	....	....	....	....	....	....	....	....	....	.100	.031	200
6	.100	.050	330	10.0	20.0	....	....	....	0.22	0.11	720	0.02	0.01	66	.320	.160	1,056
7	.113	.021	1,081	8.9	47.4	0.259	0.048	2,422	....	....	....	.03	.005	281	.182	.034	1,753
8	.032	.025	365	30.9	40.0	....	....	....	....	....	....	....	....	....	.077	.059	881
9	.031	.025	284	32.0	39.7	.091	.070	660	.007	.006	55	.019	.015	140	.091	.073	678
	.059	.024	2,722	17.0	42.4	....	....	....	....	....	....	....	....	....	.144	.058	6,646

TABLE 4—OPERATING COST—DOLLARS

Job No.	Equipment cost		Rental—Fuel—Oil		Labor cost ²			Total direct cost ³			
	Rental	Fuel ¹ and lubricants	Per lin. ft.	Per cu. yd.	Total	Lin. ft.	Cu. yd.	Total	Lin. ft.	Cu. yd.	Total
1	216.00	....	0.12	0.06	216.00	0.02	0.01	28.20	0.14	0.07	244.20
2	315.00	....	.18	.08	315.00	.12	.05	213.20	.30	.13	528.20
3	801.00	....	1.34	.08	801.00	1.93	.12	1,160.30	3.27	.21	1,961.30
4	800.00	52.90	.10	.10	852.90	.03	.03	218.00	.13	.13	1,070.90
5	1,000.00	....	.49	.16	1,000.00	....	....	....	.49	.16	1,000.00
6	1,015.03	153.99	.35	.18	1,169.02	.28	.14	923.49	.63	.31	2,092.51
7	3,853.31	307.28	.43	.08	4,160.59	.26	.05	2,497.01	.70	.13	6,657.60
8	2,392.00	....	.21	.16	2,392.00	.04	.03	449.00	.25	.19	2,841.00
9	1,041.05	125.01	.16	.12	1,166.06	.07	.06	498.97	.23	.18	1,665.03
	11,433.39	639.18	.26	.11	12,072.57	.13	.05	5,988.17	.39	.16	18,060.74

¹ Included in rental unless otherwise stated.

² Operators' time included under rental when equipment rented on fully operated basis.

³ Nominal explosive costs not included.



Discovery of apex of vein in angledozer trench. Just below, sulphide mineralization extended over full width. Coeur d'Alene district, Idaho

The ideal conditions for angledozer trenching are on bare or grassy slopes of 20 degrees to 30 degrees, where the overburden is 5 to 10 ft. deep. By trenching along the contours, or at a slight down-hill angle across them, the operator can side-cast the soil with minimum waste motion. Steep slopes with less than 4 or 5 ft. of soil cover require transportation of dirt to build up a roadway; this results in a tremendous lowering of efficiency. The angledozer is an efficient dirt mover only when the distance moved is very short. This fact also limits the efficiency of the angledozer when trenching on gentle slopes or level ground. If the slope is too gentle to permit side-casting, all dirt must be pushed out one end of the cut; this limits the economic length and depth of the trench. Nevertheless, very good efficiency can be obtained on level ground if the cuts are less than 5 ft. deep. Trenches up to 10 ft. deep and 100 to 300 ft. long have been dug in level country at a reasonable cost.

Trees up to 6 in. diameter, if not too closely spaced, can be efficiently cleared by the heavier (60 hp. or over) machines. Larger timber or very dense growths of light timber should be partly cleared by hand and the stumps blasted. Hardpan, partly decomposed bedrock, and large inter-

locked boulders or rocks require preliminary blasting if the angledozer is to be used at its greatest efficiency. The relatively high cost per yard of Job 6 was due largely to digging partly decomposed bedrock and frozen overburden without blasting. On the other hand, the cost per yard of Job 3 was nearly average, even though more than 25 percent of the material moved was rock in place. Much of this rock was so thoroughly decomposed that it could have been moved by the angledozer without preliminary blasting; however, the efficiency of the equipment would have been greatly reduced and the over-all cost increased.

It is frequently necessary to clean the trench bottom by hand or even to sink shallow hand trenches below the bottom of the dozer trench. However, this work can be closely limited to places where ore structures intersect the main trench. It is also advisable to have an observer always on hand when the angledozer is digging near bedrock. Otherwise, important indications may be exposed and then covered again before they are recorded.

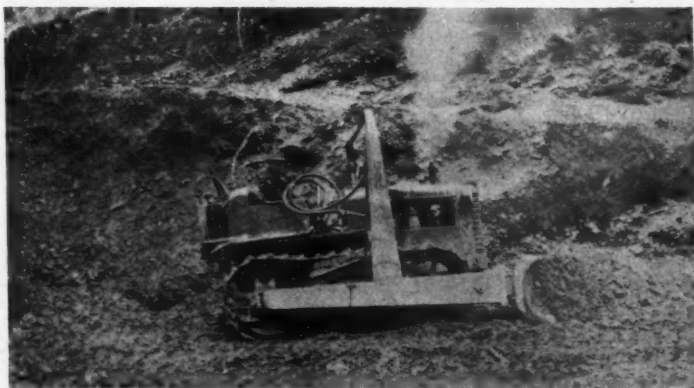
The accompanying cost tables* give only the direct cost of prospect trenching because it is believed that this will afford the best basis of comparison. Overhead charges, transportation, and preliminary excavations, such as access trail construction, differ in nearly every case. Furthermore, the equipment is ordinarily used for other purposes, such as hauling supplies beyond the limits of truck transportation, excavating diamond-drill stations, snow removal, etc. On pioneer operations a tractor-dozzer for general utility uses has become almost indispensable.

The foregoing data show that prospect trenching by angledozer may be done at from one-half to one-tenth the cost of hand trenching per linear foot and at incomparably greater speed. The greater width of the trench bottom permits much better observation of geologic structure and more accurate sampling of any veins or lodes exposed. Furthermore, the trenches will remain open to inspection for much longer periods. These factors have greatly increased the use-

(Continued on page 73)



Typical angledozer trench on gentle slope in heavy undergrowth. Coeur d'Alene district, Idaho



Angledozer working on side hill trench. Coeur d'Alene district, Idaho

*The writer wishes to acknowledge the assistance given by staff engineers of the Idaho District Office, Bureau of Mines, in collecting and compiling the data given in the tables accompanying this paper.

Work of the National Fuel Efficiency Program

A Review of the Effort Being Made to Conserve Natural Resources Through Improvements in Fuel Utilization and Care from Production Point to Consumer

THE National Fuel Efficiency Program is planned to prevent the waste of our natural resources. Some of us stressed the possibility of a fuel shortage that would shut down industrial plants and perhaps cause many folks to be uncomfortably cold in their homes. It is still quite possible to have a fuel shortage of this magnitude. We are currently short over 22 million tons of coal, bituminous and anthracite, and our stock piles are much smaller than they were a year ago. Incidentally, we used over 27 million tons of bituminous coal from storage during the last coal year, which indicates we used over 616 million tons of coal instead of the 589 million tons produced. No one can predict the weather we will have in the 1944-45 winter; if bad weather should add to our difficulties, who can say we will not be faced with serious deficiencies of supply?

A fine program that would have included many regional offices with paid engineers covering the country was developed by John F. Barkley, chief, Division Solid Fuels Utilization for War, but those with authority to pass on such matters did not make available the funds to carry out the work. A new start was made in 1943 when the writer went to Washington to supervise the new program.

The National Fuel Efficiency Program is planned to be a common-sense, logical approach to waste prevention in industrial-commercial plants, and the type of men who form the Advisory Council indicates the kind of thinking that went into the plan.

These men are: O. F. Campbell, combustion engineer, Sinclair Refining Company, East Chicago, Ind.; W. G. Christy, smoke abatement engineer, Hudson County, N. J., Department of Smoke Regulation, Jersey City, N. J.; C. F. Hardy, chief engineer, Fuel Engineering Division, Appalachian Coals, Inc., Cincinnati, Ohio; H. K. Kugel, smoke regulation

engineer, District of Columbia, Washington, D. C.; L. S. Reagan, vice president, Webster Engineering Company, Tulsa, Okla.; C. A. Reed, director of Engineering Department, National Coal Association, Washington, D. C.; R. C. Johnson, vice president in Charge of Research, Anthracite Industries, Inc., Primos, Pa.; R. A. Sherman, supervisor, Fuels Division, Battelle Memorial Institute, Columbus, Ohio; A. W. Thorson, chief, Conservation Division, Solid Fuels Administration for War, Washington, D. C.; J. E. Tobey, managing director, Coal Bureau, Upper Monongahela Valley Association, New York, N. Y.; J. F. Barkley, ex officio, chief, Division of Solid Fuels Utilization for War, Washington, D. C.

Over 5,000 Regional Engineers

Aid in carrying out the program was solicited from the fuels and related equipment industries, and the response was heartening. Over 5,000 engineers employed in the above groups either volunteered directly or were suggested by their employers to give such time as they could afford outside of their regular pursuits. These men we call regional engineers.

The next problem was to fit the program to local conditions and to prevent duplication of effort. An executive, usually engaged in engineering activities, was solicited in each principal city of the country to act as coordinator for a local area. We were very fortunate again and have, at the moment, 177 coordinators who have attained various stages of accomplishment of the aims of the program.

The coordinators select an Advisory Committee to help in the program and



By THOS. C. CHEASLEY

Supervising Engineer
National Fuel Efficiency Section

to divide the work among many in order to ease the coordinator's load, and again well-known engineering men are selected to serve as advisory committeemen.

Hundreds of other members of the American Society of Mechanical Engineers, the American Institute of Mining and Metallurgical Engineers, the American Society of Heating and Ventilating Engineers, the Illinois Mining Institute and other engineering societies, are assisting in various ways.

The civil and electrical societies are well represented also, so it is obvious that the engineering approach to the problem of conservation has been stressed to the point of virtual exclusion of non-technical men.

All Federal Government agencies are co-operating. The Office of the Chief of Ordnance, Army Service Forces, the Fuels

and Utilities Branch, has accepted the program for application to plants of ordnance contractors, and its engineers are acting as regional engineers in connection with those plants, reporting to the coordinators and sitting on the various Coordinators' Advisory Committees.

The Federal Public Housing Authority has adopted the program,



This bank saves heat. Learn to care for fires properly

Prepared for MINING CONGRESS JOURNAL by permission of the Director, Bureau of Mines, U. S. Department of the Interior.

through the coordinators, for its centrally-heated projects.

The War Production Board has been very cooperative. Among other things, it has issued amendments simplifying the procedure under which equipment can be secured up to a total installed value of \$25,000 when certified for conservation purposes by a coordinator.

The Public Buildings Administration has put the program into effect in its many buildings throughout the country, 156 being enrolled in Washington, D. C.

The Office of Price Administration has been very helpful, and the Solid Fuels Administration for War has agreed to help with publicity for our program.

The National Fuel Efficiency Program is a planned approach to the consideration of the various factors that affect utilization of fuel and energy, with recommended methods of preventing waste of fuel, directly and indirectly, and is designed to correct wasteful practices in production, transmission, and utilization of steam. It should be stressed that less than 50 percent of the waste prevention is expected to be accomplished in boiler rooms, and the bulk of the work will be done in connection with the distribution of steam, hot and cold water, compressed air, etc., and in the efficient utilization of energy for process and material-production work.

The regional engineer is asked by the coordinator or committeemen to visit the fuel-consuming plants in a preassigned area and to enroll management in the program with the signing of the compliance pledge. The executive of the plant is requested to "sell" the plan to his organization and to appoint a waste chaser, who is the contact man for regional engineers and who is responsible to management for results. He also signs the pledge with the regional engineer.

A quick survey is then made of the premises, when a check sheet is filled in, noting obvious losses or points to which attention should be directed. A copy of the check sheet is left with the waste chaser for future study.

These steps, of course, precede the actual work of the program, which begins with the delivery of the pertinent quiz sheets, one at a time, to the waste chaser. The quiz sheets are brief, thought-provoking single sheets. They cover the salient points of oper-

ation of the various components affecting energy utilization. They are prepared and printed by industry committees representing the various

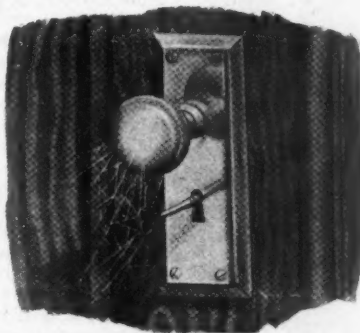
groups. For example, Quiz Sheet No. 1 was sponsored by a bituminous coal committee and covers the hand-firing of bituminous coal in heating boilers. All of the first six quiz sheets relate to small and medium boilers; No. 2, prepared by the Stoker Manufacturers Association, covers stoker firing of bituminous coal; Nos. 3 and 4 are by Anthracite Industries and relate to hand and stoker firing of anthracite; No. 5, by the American Gas As-

sociation, covers gas firing; No. 6, by the Oil Heat Institute, relates to firing of oil fuel; and Nos. 7 to 12, inclusive, were furnished by American Boiler Manufacturers Association and relate, respectively, to the various methods of burning coal, hand-fired, underfeed, and pulverizer, and oil and gas-fired installa-

literature, brochures, etc., which may be obtained by the waste chaser if he is interested enough to send for them.

If the program is based on common sense and logical reasoning — and we feel that it is — there seems to be no reason why any fuel user should not cooperate. Moreover, it appears that the men in the fuel industries should support it wholeheartedly and if it is not known who the coordinator is in the area in question, to write to the National Fuel Efficiency

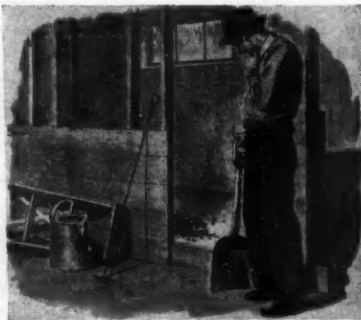
Section, Bureau of Mines, Room 4421, New Interior Building, Washington, D. C.



Sign of a good housekeeper? Sure—an unused bedroom is closed up



This man is up in the air. Because he's down to earth about conserving coal



The "might have" bin. He waited too long to order coal

tions. The balance of the quiz sheets relate to instruments, large and small, of the various types, steam, hot-water, and compressed-air distribution and utilization, heat exchangers, insulation, ventilation, traps, pumps, electric losses, etc. There will be approximately 100 quiz sheets but, of course, only com-

paratively few of the total ordinarily will go to any one plant.

We have tried to visualize all the losses attendant upon operation and to get the best information from the best sources covering each. In addition, we attach a memorandum to each quiz sheet, indicating to the regional engineers the source of additional

various competition from other fuels during the past 20 years. Some consuming areas of our country were particularly upset by natural gas pipe lines or petroleum products, or both.

Coal is claimed to be the basic fuel of the world; nevertheless, due to economies, convenience, or other factors, much coal tonnage has been displaced. In the long-range view there appears to be no doubt that coal, with its estimated 3,000-year reserves, will continue to be the greatest energy producer we know about; but, in a normal lifetime there will certainly be competition from other fuels to the extent that certain coal-producing areas will feel the pinch to an alarming extent, if not to a fatal conclusion.

Consuming areas that may be served with burning oils delivered by tanker doubtless will continue to burn liquid fuels in large quantities, at least until the question of petroleum reserves has been settled. There is still heated controversy in the ranks of petroleum men, as well as outside the oil industry, as to probable future oil



Warm—but not fair! Careless firing results in wasteful over-heating

supplies. I doubt if anyone knows the completely correct answer, but it seems safe to say that a definite trend has set in which indicates that new oil discoveries are continuously found to be of the lesser order and, according to some, all of the large pools in the United States have been located. What effect the importation of oil will have has been variously estimated. Some think it will cause a calamity, others that little notice need be given it.

The natural-gas reserves of the Nation seem to be fairly well defined at approximately 100 trillion cubic feet. The largest single known reserve is in southwest Kansas and Oklahoma, and it is estimated to contain 23½ trillion cubic feet, equivalent to one billion tons of coal. The coal industry is currently producing, nationally, nearly two-thirds of a billion tons per year, so one may see by this comparison, that, at the present rate of use, the natural gas reserves will be with us for some time. With present and contemplated pipe line distribution of gas, there will probably be few areas of the Nation that gas will not reach.

What can the coal industry do about all this? It is generally agreed that we, as a Nation, have been wasteful, some say sinfully so. I think we must accept that premise, but I see no reason for continuing to waste our natural resources, whatever they may be. There are many examples of waste in the coal mining industry about which something should be done, the overloading of cars at tipples perhaps being one of the more outstanding. On the load tracks of almost any mine one could find enough coal to run a good sized boiler or heat a block of buildings. In the railroad classification yards the story is repeated, and the loss does not end until the car comes to rest at the user's siding.

Many other factors could well be considered in addition to losses in the transit of coal which come from overloading cars, or through failure to properly patch holes, cracks, etc. Discretion should be used in patching

leaks in cars. Pulverized-coal burners are sometimes chronically clogged with trash, which has been used for patching material; this does not promote good public relations. The possible recovery of marketable coal from hand-picked or mechanically-separated impurities has not been scrutinized closely enough in most instances.

Because boiler-plant fuel is available in adequate quantities and is relatively cheap, many mine power plants do not attempt to conserve fuel.

If the proper technique is used, almost any coal can be stored at or near the point of use by consumers. If, however, foreign material such as straw or hay, paper, rags, etc., is shipped with the coal through carelessness, it is likely that spontaneous heating and/or combustion may start with, or in proximity to, this trash—preventable waste of fuel and manpower. The storage of coal is not necessarily an art, but many common-sense practices may be followed at the mine or preparation plant which will help prevent loss of coal in storage, for example:

- a. Don't mix coals from different seams.

- b. Don't ship for customer storage, coal which has been produced at a different time period. That is, don't mix freshly-mined or recently crushed coal with coal that has been stored.

It is indicated and hoped that the men at the mines will develop a program of their own, covering the points so far raised, and in addition the many phases not touched upon which will prevent waste at the source of coal production. All this wasted coal requires energy to produce, and each ton has been paid for by the operator. In addition, it came out of reserves.

We know that decreased production of Districts 7 and 8 coals will affect over half of the 48 States and will cause maladjustment of supplies that might require long-haul movements of coal from hitherto unknown fields to supply necessary requirements. But we are not, in the National Fuel Efficiency Program, asking or suggesting that the program be based on an actual or threatened fuel shortage. We believe that the prevention of waste of natural resources is good business and that we should all be interested from that viewpoint alone.

Illustrations from Chesapeake & Ohio Lines' Campaign, "Save Coal—and Serve America"

ONE POUND OF COAL WILL MAKE

.....

ENOUGH ELECTRICITY TO LIGHT ONE FIFTY WATT ELECTRIC BULB FOR TWENTY HOURS.

.....

ENOUGH STEAM TO HAUL 1000 POUNDS OF FREIGHT 1.2 MILES.

.....

ENOUGH WARMTH TO HEAT A ONE FAMILY HOME FOR 22 MINUTES DURING THE WINTER.

.....

ENOUGH COKE TO PRODUCE STEEL FOR 4.8 FIFTY CALIBRE MACHINE GUN BULLETS.

SOURCE: BITUMINOUS COAL INSTITUTE
GRAPHIC BY PICK-S.

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MINING CONGRESS JOURNAL

Gold and Silver as Money in The Postwar World

The Fundamental Demand of the Overwhelming Majority of Mankind, Based on its Age-long Experience, Accented, Even Multiplied, by that of the Two World Wars of this Century, Ultimately Will Compel Again the Use of Both Gold and Silver



By FRANCIS H. BROWNELL

Chairman of the Board of Directors
American Smelting and Refining Company

BEFORE considering the future of gold and silver as money, it may be helpful to review briefly their history after mankind had generally adopted them as money.

Until after the Napoleonic wars, gold and silver at various ratios to each other (usually 15, 15½ or 16 oz. of silver to 1 oz. of gold) were used as money by all important nations. But the prices of both gold and silver were constantly varying with supply and demand. Hence, they were also constantly varying with each other in ratio as the market of either metal changed. Credit could not be granted with the option of paying in either metal at the existing legal ratio without probable loss to the creditor and gain to the debtor, since the latter would pay in the cheaper metal. Even if the debt were specified as payable in one metal—for example, gold—the situation was not much improved, for gold might be and often was of a different value at the time of maturity of the debt than it was at the time the debt was incurred. If the price of gold had advanced when the debt became due, the lender made an unbar-gained-for gain, with corresponding loss to the debtor. If the price fell, the creditor made a loss and the debtor a corresponding gain.

The Value of an Unvarying Standard

When England, after final victory in the Napoleonic wars, came to reorganize its monetary system, it decided to try to avoid the evils of a money varying with supply and demand as both gold and silver had previously varied. Its statesmen realized that the most important function of money is that of being a permanent standard or measure of value of all other goods and services. If gold and silver, either or both, are used as money, their value in themselves, i.e., their market price, must not change, as otherwise they

become a variable measure of value of other commodities. This fact had not been realized in any previous monetary system. But England realized it and in order to provide an unvarying standard, decided to try to peg the price of gold. It chose gold because it happened at the time to have more gold (in value) than it had silver and because gold, having greater value in the same weight, is better adapted to international trade. Accordingly, England made its unit coin consist of a specified number of grains of gold and then fixed or pegged the price of gold by directing the Bank of England to purchase all gold on offer in unlimited quantities at £3 17s. 9d. per standard ounce, and to sell all gold on demand in unlimited quantities at the same price, plus a small handling charge of 1½d., about 3¢ in United States money. This price of gold pegged by England was equivalent, in United States money, to \$20.67 per fine ounce, delivered at United States mint.

The price of gold was thus effectively pegged and it remained constant, notwithstanding wide fluctuations and large increases in the supply of gold from time to time, as the great gold fields of California, Australia, South Africa, Alaska and Canada were successively discovered. The annual production of gold increased over 50 times, from less than 400,000 oz. in 1816, to over 21,000,000 oz. in 1914, when the First World War broke out. But the price never changed. As a standard or measure of value, the result was all that could be desired. The effect was magical. It made London the banking center of the world and contributed very largely to the commercial and banking supremacy which England achieved during the nineteenth century. The beneficial effects were so pronounced that ultimately it led the newly created German Empire to adopt gold monometal-lism after the Franco-Prussian war of

the early 1870's, and Germany's action soon compelled other nations to do the same. Even the United States abandoned in 1873 the free coinage of both gold and silver at a fixed ratio.

For the remainder of the nineteenth century and until the First World War, a period of about 50 years, the gold standard, with a pegged price for gold, reigned supreme.

But the price of silver was never pegged as was the price of gold. So far as silver was used as money, it continued to be an unstable standard, varying in price from time to time with changes in its supply and demand. No wonder that silver lost its prestige and came to be regarded as too changeable in price to be used as money. As gold was sufficient in quantity at that time, there was no incentive to peg the price of silver as gold was pegged, and so the use of silver as money was gradually lessened, almost abandoned except as subsidiary coinage.

The Nations Leave the Gold Standard

The First World War threw Great Britain and many other participating nations "off gold" temporarily. At its conclusion there was no hesitation on the part of all these nations in desiring to return to the use of gold. In Central Europe, particularly in Poland, Czechoslovakia and Hungary, there was a demand for new silver coinage because of people's loss of confidence in paper money. No money was considered trustworthy unless adequately backed by gold or silver, or both.

England went back to gold in 1926, but notwithstanding gallant attempts to stay upon the gold standard, she

Read before The Northwest Mining Association, Spokane, Wash., December 1, 1944.

was forced to abandon it in 1931 and her example was shortly followed by other European nations. In 1933, even the United States "went off gold," and in 1934 stopped all new gold coinage, withdrew all gold then in circulation and made it a penal offense for any individual, including corporations, to own more than \$100 worth of gold except that specifically allowed in process of mining and fabricating or held in fabricated form, such as jewelry. In the same year, the United States raised the price of gold to the \$35 per ounce level, but did not adopt measures to peg, or stabilize it at that figure, since it would not sell freely at that price.

Today there is no nation on the gold standard in any actual true sense, nor has there been for ten years or so.

The breakdown of the gold standard is complete. And it was not caused by the present World War. It happened before that war began—several years before. The physical insufficiency of gold was the main cause.

After the breakdown of the gold standard, Great Britain went to a "managed currency" system. It sought, through stabilization agreements with many countries, to substitute the English pound in place of gold over as wide a world area as possible, often referred to as "Sterling-area." Other countries were forced to develop national bargaining in the exchange of commodities, a quota system or various other substitutes, all of which proved to be inadequate to carry on international trade at anything like its former volume. When the United States raised the price of gold to \$35 per ounce in 1934, much of the European gold came to the United States in payment of its balance of trade. In short, the world monetary condition between 1931 and the outbreak of the present World War was one of great uncertainty and confusion.

The experience with overissues of paper money in the First World War was relatively small as compared with the overissues and the monetary chaos that will exist at the end of the present war.

The Monetary Situation at Close of Present War

Let us now briefly survey the monetary situation of various nations at the close of the present war since the future monetary use of gold and silver will be largely dependent thereon.

First, Great Britain. One would naturally expect that, as the first to peg the price of gold and so to originate the single gold standard, to her own great benefit, Great Britain today would be, as it was after the last war, the leading advocate of a return to the former gold standard. No definite policy has been announced as yet, but the statements of some of her leading economists and statesmen, and action

so far taken, all seem to indicate a future monetary system which controls the external value of the pound in accordance with its internal value. Such a managed monetary system probably will, but may not, utilize gold. Just how gold would be used is not yet disclosed. But it would seem that in carrying out the main purpose of maintaining control over the external value of the pound, one of the two following alternatives would necessarily result in use of gold:

(1) If the price of gold is not pegged by the United States, Great Britain must act as if the price of gold is not pegged but a flexible market price substituted. This, in effect, would be to return gold to its status prior to the Napoleonic wars. It no longer would be a fixed, constant measure of other commodities. Its price would again vary with supply and demand. It no longer would be an invariable yardstick of values. Or—

(2) If the price of gold is pegged (by the United States, with or without other nations, including England), the number of grains of gold in the monetary unit will not be a definite quantity, but either (a) will be changeable to the extent necessary to keep the external value of the pound the same as its internal value, or (b) the pound and sovereign will not be tied to gold at all, but gold might be accepted in international exchanges as the equivalent (at its pegged price) of the pound at its changeable values.

Great Britain Cannot Endanger Her Own Economic Situation Even to Help Dominion Gold Production

It seems highly improbable that Great Britain actually desires that the use of gold as money be ended. The British Empire produces over 60 percent of the newly mined gold of the world, excluding Russia, from which we have no figures. Of the British production, the three Dominions—South Africa, Canada and Australia—produce nearly half of the total production of the world. South Africa alone supplies over one-third of the new annual world production, excluding Russia. Great Britain itself produces no gold.

But however much Great Britain might like to favor the interest of its three large Dominions, she dare not endanger her own economic situation in order to help Empire gold production. We must remember that Great Britain had a bitter lesson in attempting to return to the gold standard after the First World War. She was unable to remain on gold and she is now much less able to return to that standard because of the greatly increased exhaustion of her wealth caused by the present World War. The nation's indebtedness owed at home has more than doubled. She

was compelled to block English sterling and so now owes other nations, including India, several billion pounds, estimated to equal about 12 billion dollars. The stocks and bonds owned by her nationals in foreign companies have been commandeered and sold to purchase war munitions. During this war, her foreign trade and foreign banking have been practically lost. Looking to the future, Great Britain's chief aim must be not only to regain, but greatly increase, the export position she formerly held and also to regain her former position in shipping and in world banking. She has not sufficient gold (or ability to get it) to enable her to return to the gold standard unless the United States helps. So Great Britain plans returning to the monetary policy followed between 1931 and the beginning of this war, viz., to tie to the English pound (which is not convertible into gold) the currencies of the rest of the Empire and of as many other nations as possible, particularly those of Western Europe—France, Belgium, Holland, the Scandinavian countries, Portugal, Spain, etc. This will naturally be followed by tariff agreements. The following account in the *Wall Street Journal* of October 6, 1944, describes the plan:

LONDON—Sir John Anderson, Chancellor of the Exchequer, has announced that he has signed, on behalf of the government, an Anglo-Belgian financial agreement, soon to be followed by a similar Anglo-Dutch agreement. This announcement is taken here as marking the first stage of a prospective Western European system of monetary cooperation intended to stabilize exchanges and facilitate reciprocal trade.

It is expected that France, Norway and Denmark will arrive at similar agreements with Great Britain as well as with each other, thus completing the Western European financial link-up.

Complementary tariff agreements have not yet been formally discussed, perhaps because a resumption of trade, except on a most limited scale, will be impossible for many months to come. But it is reasonable to interpret the completed or prospective monetary agreements as preparing the way for them.

The Anglo-Belgian agreement follows closely the lines of the recent Belgo-Dutch arrangements, the avowed object of which was to facilitate commercial exchange under a free trade or at best a low tariff. The first step has already been taken in waiving all duties on reconstruction goods exchanged between the two latter countries.

Russia: Owing to her form of government, Russia's position is radically different from that of other nations. Little, almost no, Russian money has been allowed to go outside the boundaries of Russia. Her foreign trade is carried on by the government itself, which ultimately owns all of the commodities produced in Russia. She can sell those commodities in whatever country best enables her to acquire the products she needs. Hence,

Russia will probably take relatively little interest in the settlement of the money question, except that she will be anxious to have gold retain its value because of her own mine production, which probably will not be used as money at home, but in settling any adverse balances of trade abroad.

Continental Europe: It is quite certain that present German paper money will be worthless. The nations under the Russian sphere of influence—Poland, Czechoslovakia, Hungary, Rumania, Bulgaria and Yugoslavia — have seen their paper moneys also become practically worthless. Probably an utter distrust of inconvertible paper money and a desire for gold and silver will force the use of as much gold and silver as can be obtained. These countries are less likely to tie their currencies to the English pound than are the other countries of Europe.

Denmark, Holland, Belgium, France, Greece, Italy, Spain and Portugal will be very likely to tie to the English pound and go on a "managed currency" system, until at least the United States makes known its own definite policy. After their bitter lessons in paper moneys, these countries would prefer a gold and silver base for their currencies, but if they cannot get an adequate amount of either metal it will be impossible for them to do otherwise than go to a "managed currency" system.

Asia: Japan has been issuing the paper money necessary to carry on the war. It, like that of Germany, probably will be utterly worthless when the war is over.

China has financed its war on paper money. Its issue is so vast that a new currency will have to be established. An article in the *New York Herald-Tribune* of October 29, 1944, says:

The flood of paper money has created a physical problem. Business men in some sections hire coolies to carry the bulging bags of legal tender as they go about keeping appointments. Shoppers tuck loads of it under their arms as they go to market.

India: The people of India, as in the First World War, are demanding silver. Both gold and silver are selling at a premium in India. The great mass of her people has always required silver and it is quite probable that in the relations that will exist between England and India after the war, the needs and desire of the Indian people for a greater use of silver and for the stabilization of its price will be met.

United States: The United States owns almost 60 percent of the world's monetary gold (*Federal Reserve Bulletin*, November, 1944) and over half of its monetary silver. It is a large mine producer of both metals. Obviously, its interests will be furthered by the retention of both gold and silver as money in the future world. Private

ownership of gold except in fabricated form is now not allowed. Government-owned gold is not sold except under severe restrictions, and then only to other governments or their central banks. While the United States buys all gold that may be offered at \$35 per ounce, it makes no effort to peg the price of gold, since it will not freely sell it at the same price or, for that matter, at all except under very limited restrictions. Gold is now selling at the equivalent of over \$35 per ounce in many nations.

How Can United States Gold and Silver Function to Help the World Monetary Situation?

How far the other nations of the world can resume the monetary use of gold and silver after the war will depend upon the action of the United States. It is impossible for them to go back to a gold standard when owning only about one-third of the total monetary gold of the world, while the remaining two-thirds are held locked up in the United States. This is a most important fact not generally realized. And in the case of silver, while one-half of the monetary silver is held in the United States, it is difficult to see how the world can return to silver to the extent many of its people will desire. It seems certain that if the United States

wishes gold and silver to continue to be used as money, it must find some way in which its excess gold and silver can be utilized by the remaining nations of the world. How can this be done?

The former gold standard broke down several years prior to the beginning of the present war, mainly because of the physical insufficiency of gold to meet the demands of the enlarged volume of world trade. Also, what gold there was, became concentrated too much in one nation—the United States.

Silver Must be Included

But the physical insufficiency of gold can be met by fixing or pegging not only the price of gold but also that of silver, so that the price of both metals would be pegged just as the price of gold was pegged in the days of the supremacy of the gold standard. The value of silver, thus stabilized, would be, in effect, an addition to the supply of gold. Such a system is just as workable as is the single gold standard and under existing conditions far more advantageous. It in no way impairs or diminishes the full use of gold. On the contrary, it continues to use all gold as much as under the single gold standard, and so retains every advantage of the gold standard, plus the additional ad-



Alexander Hamilton's statue in front of the U. S. Treasury

vantage of curing its physical scarcity.

Under such conditions, either gold or silver, or both, could be used as best fitted the necessities of each individual and each nation. Each metal would be a standard measure of value. Each would have a constant, fixed, pegged price. Any fluctuation in the market price of both metals would become impossible, regardless of increases or decreases in their production. "Gresham's Law" would have no chance to operate, because the prices of both metals could not move out of line, either with the mintage ratio or the ratio of each to the other. The world would then have the equivalent of a larger supply of gold and the added benefits of a monetary metal with the traditions of thousands of years behind it, one which is more widely distributed than gold today, and one which seems to be necessary to satisfy the monetary needs of much the larger part of the world's population in Asia, Africa, Latin America and parts of Central Europe. These people would like to use silver as the chief medium of exchange. They have few or no banks and could not use them if they had, because their transactions are too small. Paper money cannot meet their requirements, not only because they have no confidence in it, but also because it is subject to loss by fire, perspiration, disintegration in a warm, moist climate, etc. Coins of the equivalent of from 10c to 50c and having that intrinsic value are necessary, and silver is and always has been best suited for such needs, since gold coins of such values would be too small for use. Unless such coins have a fixed, constant value, confidence in them becomes impaired,

a condition which, as we have seen, greatly lessened the use of silver as money.

The United States Cannot Afford to See the Use of Gold and Silver Abandoned

Some way should be found under which Great Britain and the United States will agree upon the use of gold and silver, fixing and pegging the price of each. The United States can well afford to make the necessary loans of gold and silver to bring this about. It would be calamitous for these two great nations to engage in a serious and prolonged battle over monetary systems.

But if Great Britain and the United States fail to agree upon a monetary plan, what then? *Obviously, the United States cannot afford to see the use of gold and silver abandoned. She must fight for their retention.* The United States alone should undertake to fix and peg the price of both gold and silver. For nearly ten years she has pegged the minimum price of both gold and silver, and during that time bought an amount equal to the total new production of each metal and, in addition, much of the previously mined supply of both. The United States has actually demonstrated its ability to peg the price of both metals at the same time. Should the United States adopt the system of pegging the price of both gold and silver, it would have the best currency in the world. It should then freely coin and circulate its redundant gold and silver. Latin America, Asiatic nations, most of those nations whose currency has

been ruined by the present war, would much prefer to tie to such a money rather than tie to a "managed currency" system of England, assuming England does not join in the plan. In short, the then money of the United States would give it the same advantage that the action of England, in pegging the price of gold after the Napoleonic wars, gave to it. The United States would become the financial and banking center of the world, for, like England in the nineteenth century, it would become the world clearing house because of being the nation having the best and most stable money in the world. All other nations would want to avail themselves of that money.

In concluding, I venture the opinion that, however much the statesmen and leaders of nations harassed by debt, shortage of gold and silver, and overissues of paper money may wish to work out some system of "managed currency," such currency will not command the confidence of the people, as would gold and silver. The fundamental demand of the overwhelming majority of mankind, based upon its age-long experience, accented, even multiplied, by that of the two World Wars of this century, ultimately will compel again the use of both gold and silver. Paper money will continue to be used, but tied to gold and silver and convertible thereto. This cannot be done so long as the United States locks up nearly two-thirds of the world's gold and one-half of its silver. Our country now has the opportunity to win both commercial stability and international leadership by establishing the soundest monetary system the world has known.

Commercial Availability of Silicones Announced

FIRST commercial production of "Silicones," new organo-silicon polymers, has been announced by Dow Corning Corporation of Midland, Mich. Development of silicones on a semi-production basis has been in progress for a considerable time. Several of these products are now being made available to the war effort. The products include water white fluids for high and low temperature use, electrical varnishes and insulating resins for high temperature operating electrical equipment, and lubricating greases for high temperature and chemical resistant uses. These products, because of their unusual properties, are reported to have solved many problems where conventional materials have failed.

Dow Corning Corporation was formed in February, 1943, by Corning Glass Works and the Dow Chemical Company to manufacture and develop silicones more intensively. Since glass is a silicon product, it was believed

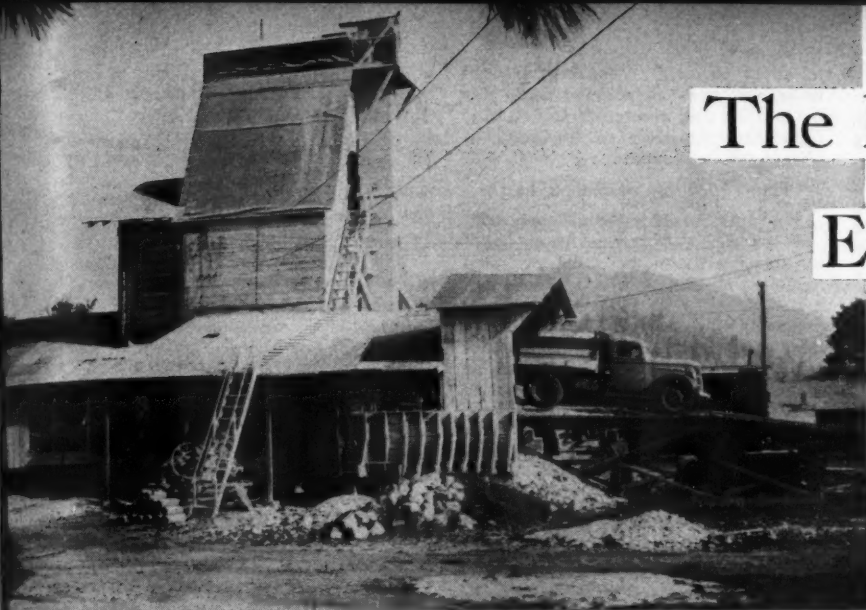
possible that organic derivatives of silicon should yield products having some unusual and valuable properties, perhaps similar in some degree to those of glass.

In the investigations water white liquid polymeric silicones were discovered having unusual chemical and physical properties. These materials, which are very interesting from an engineering standpoint, are now available under the name of Dow Corning Fluids. They are manufactured in various viscosities ranging from liquids as thin as water to those which barely flow at room temperature. Their most outstanding property is an exceptionally low rate of viscosity change with temperature, compared to that of previously used liquids. Certain types are made that do not freeze at dry ice temperatures and these same products can be used at temperatures up to 400-500° F.

Among the products are electrical insulating varnishes and resins which are now available. These materials are the culmination of early efforts by Corning research workers

to find suitable coating resins for use with glass textiles for electrical insulation or for other purposes where elevated temperatures are apt to be encountered. In general, none of the organic varnishes was substantially better, from the standpoint of heat resistance, than the cotton or paper usually used in electrical windings. Hence there was a definite need for resinous dielectrics that would not decompose and carbonize when electrical equipment was overheated.

Silicone resins for electrical insulation are said to extend the range of operating temperatures possible in electrical equipment beyond the limit of thermal stability of conventional organic materials. These materials do not carbonize or darken when subjected to prolonged heating at the curing temperatures. In combination with Fiberglas, asbestos and mica, these impregnating and coating resins permit the design of many types of electrical equipment for higher safe operating temperatures with consequent increase in capacity, reliability, and life performance.



The Bristol Silica Enterprise

By F. I. BRISTOL
Bristol Silica Co.

Crushing, screening, sacking and loading for shipment is done at Rogue River

THE Bristol Silica Company, Rogue River, Oreg., is the result of study of the present and prospective needs of the industrial area of Portland and San Francisco and intermediate points.

The silica deposit, some 2,800 ft. in length and 480 ft. maximum width, lies on the side of a ridge in Miller's Gulch, 1½ miles airline from the Southern Pacific Railroad, near the town of Rogue River on the famous fishing stream, Rogue River.

Deposit is Geologically of Interest

Average analysis of the deposit, which was arrived at by trenching, is 99.6 percent SiO_2 . It is estimated there is in excess of three million tons of this material above the quarry floor, with the depth below this unknown.

Because of its unusual characteristics, most visiting geologists have looked at the deposit. The United States Geological Survey has completely mapped the deposit and a report will soon be published.

The silica deposit, a geological freak, is generally conceded to be a very large intrusion with a shell of replacement silica surrounding the original intrusion. The whole deposit has been shattered by faulting in at least three directions. This results in the rock being in effect crushed as though by a primary crusher set at about 3 in. The quartz is very solidly in place and until "shot," is fully as tough as if there were no faulting.

The ground requires a high-speed explosive but the breakage will run nearly ten tons of rock per pound of powder.

Deposit of High Purity and Unusual Geological Character Yields a Variety of Special Quartz Products Which Find Many Uses



In the glory-hole. Note air vent for tunnel below

The deposit was very thoroughly prospected in the early days for gold, as the average prospector thought, "where there is quartz, there is gold." The deposit was also a landmark for the Indians passing from one valley to another, and parts of the huge white boulders at the top of the ridge still carry definitely-marked Indian hieroglyphics.

No thought was given to its possibilities as a silica supply until it was

examined in 1937 by the writer. At the time of discovery, there was a very limited market for raw quartz rock in the available trade area.

Marketing Possibilities

There was a prospective market for rather large tonnages of metallurgical rock in the Portland area, so it was deemed advisable to construct a small crushing plant at Rogue River, developing a market for crushed

quartz products and thus opening up the deposit.

Experimentation showed this quartz, crushed to a cubicle product, made a remarkable poultry grit which is sold under the trade name of Crystal Grit. All other quartz seen by the writer has been unsatisfactory as it breaks too sharp and splintery. Practically all the market available was for minus quarter-inch and finer.

Eleven sizes of silica are considered standard but many orders are now made up for special sizes. One outlet calls for small lots of a half ton to a ton of from two-inch rock, up. This must be hand-picked and hand-screened at the quarry.

Mining Operation is by Glory Hole

A glory hole has been opened in the quarry by driving a small tunnel into the quartz deposit and it is now carried forward from time to time. After shooting, the rock will run readily through the trap and one man can tram a hundred tons a day into a ton and half ore car which dumps into a 75-ton bin at the mouth of the tunnel.

The rock is trucked in a GMC dump truck from the bunker, which is located 1,000 ft. above and two miles from Highway 99, to the plant three miles away on the railroad siding at Rogue River. The truck backs up the ramp and dumps the rock into the raw rock bin. Here the feed of the entire plant is controlled by a man who feeds the jaw crusher. A normal day's run is 45 tons of silica through quarter-inch.

The quarry is equipped with a 110-ft. Ingersoll Rand compressor and one man with a jack hammer can more than take care of all drilling necessary for 100 tons a day. Timken bits, which are used for drilling, have a life

of about two feet. The bits are not re-ground but are shipped away for hot milling and re-tempering. It was found that the life of a re-ground bit was under two inches.

Plant Facilities at Rail Siding

The plant crushing equipment consists of a 9 x 18 jaw crusher, small gyratory with a fine crushing head and a set of 14 x 24 rolls. The screening equipment consists of two three-deck vibrating screens located above the storage bins. There are nine storage bins with a capacity of a freight carload each along with two smaller bins. One man runs the entire plant, of course, assisted by the baggers in case of a breakdown.

The discharge from the jaw crusher is carried on a 35-ft. conveyor belt to small single-deck vibrating screens

and the plus one-inch material is fed through a small gyratory crusher. This discharges onto a 15-ft. conveyor belt which in turn is carried to the top of the plant by a 60-ft. bucket elevator.

The oversize from the two three-deck vibrating screens is returned to the rolls which discharge onto a short conveyor belt. A high circulating load is carried through the rolls. Experience has shown that by adjusting the rolls and crushers, considerable variation of the final sizing is possible.

When the plant was originally built, heavy steel pipe was used for chutes but this was found to be very short-lived compared to concrete pipes. Concrete pipes made up from the silica rock itself was found to last ten times as long as the heaviest steel pipe.



Bunker, compressor house and ramp at the quarry. A GMC truck hauls to plant at railroad siding in Rogue River



Compressor shed and quarry approach ramp. Note white glare of the rock



Complex faulting has cracked the rock so that it is easy to mine



The rock runs into a trap over this 100-ft. tunnel. One man trams 100 tons per day to bunker

Ninety percent of all material shipped is bagged in multi-walled paper bags and loaded directly into box cars at the railroad siding. Practically all bulk shipments are loaded directly into the car from the vibrating screens. A warehouse with a capacity of 125 tons of finished material adjoins the bins.

All of the bins are equipped for bagging and each bagging spout is connected with the dust collection system. This system is in two sections; a Rees bag house connected to the 11 bagging spouts and the other section, connected with the crushers, elevators and screens. This uses a Cyclone and a water spray.

The plant is entirely electrically equipped. There are eight motors for a total of 70 hp. Some motors are totally enclosed but open motors have been satisfactory in much of the equipment. The plant is located near a California Oregon Power Company sub-station.

Maintenance Problems Involve Combating Excessive Wear

Maintenance of the plant is one of its biggest problems. It was long ago discovered that replacement of crusher plates and roll shells was out of the question due to their very short life. At the present time, all crushing plates are built up with hard-surfaced welding rod. Roll shells are coated at least once every two weeks along with the jaw crusher. Practically the entire crew has become adept at building up crusher parts.

Medium-priced rods work best with this particular rock. They have practically as long life as the highest-priced rods and are very much faster in deposition.

The screen cloth has amazingly

long life. Soft steel cloth seems to outlast any other.

The plant is open-shed construction since the weather is very mild at all times. All crushing equipment is located on the windward side of the plant. In this particular spot in the Rogue River valley, a three to five mile an hour wind blows consistently. The plant is constructed of wood and the bins are built of laminated two by fours.

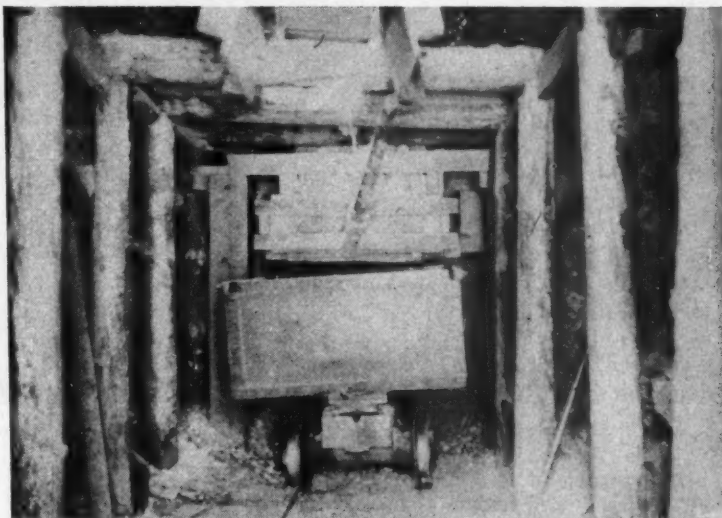
A crew of seven is employed. The foreman, Rolland Jones, drives the truck and thus is able to keep track

steadily increasing demand and shipments have been made to Alaska, Texas and east to the Mississippi.

Although the poultry grit is the backbone of the business, special industrial needs, which are practically all high-priority war orders, are running a close second.

The sales problem on chicken grit is merely a matter of knocking on the door of every poultryman in the state of Oregon to explain the new insoluble grit.

Industrial sales have problems all



After shooting, the quartz runs readily into tram car through the trap

of the plant and the quarry. In spite of the large turnover of labor due to war conditions, two of the men, Jones and Robert Gass, plant superintendent, have been with the company since its inception.

Marketing the Product

The supply for practically pure quartz chips developed has led to its

their own. This new Oregon product is replacing silica brought previously from long distances. Each silica rock has its own characteristics and requires different treatment in use, so it is a matter of time and skill of the user in the foundry or shop to solve the technical problems arising from use of a new silica supply.

Free Science in a Free Land

DR. Cole Coolidge, assistant chemical director of E. I. du Pont de Nemours & Co., indicated recently that new projects and products ready to be launched when the war is over, together with increased outlets for existing products, are expected to bring an all-time high in peace-time employment.

There is ample ground for such hopes. . . . "the great research laboratories which have been established in America since the last war represent a national asset of extreme importance in the solution of future problems, particularly the problem of providing adequate employment at our high American standards."

"Why does an American workman earn more in one day than his Oriental counterpart earns in a month? The big reason is that he produces more . . . because of the research and the investment in tools and equipment that go into the making of his job, because of the technology that stands behind him, because of the skill that he has acquired. . . . it remains for us to consolidate our gains, to continue our advance and to create a permanently fruitful economic structure. The means are at hand. Let me emphasize: It is science, it is investment in tools and equipment, and it is the American people together that can put these means to use."



The belts are covered with hinged half-sections of corrugated culvert material of heavy gauge steel, held in place with snap hooks to make inspection easy

THE WEBB PIT—Conveying, Crushing and Trucking Installation

THE Webb Open Pit mine, located in the village of Hibbing, St. Louis County, Minn., is one of several iron mines operated by the Snyder Mining Company. The ore produced is of the average grade mined on the Mesabi Range. Some of it is high enough in grade to be shipped direct without any type of beneficiation, but a portion has to be treated in a washing plant for concentration. All of the ore passes through a crushing and screening plant where the plus 4-in. lumps are reduced to minus 4-in. and rock is screened out and sent to the waste pile.

Changeover Considerations

During the early part of 1941, mining operations in the Webb Pit had reached a point where radical changes in the operation of the pit had to be

Working Under a Completely Changed Plan of Operation, this Mesabi Range Mine is Experiencing Many New Advantages

By **ANTON TANCIG**

General Mechanical Superintendent
Snyder Mining Company

given serious consideration if production was to be continued beyond the 1942 season. While several factors had a bearing on the change-over, the two that forced the issue were: (1) abandonment of the pit approach that was tying up underlying ore deposits of neighboring properties and (2) the necessity of recovering the ore under the pit track benches supporting the

existing switchbacks, which had then reached six in number.

After making studies of the various operating methods in use on the Range, it was decided to abandon locomotive haulage altogether and adopt a combination of two modern methods for getting the ore out of the pit and into the railroad cars. The ore at the shovel was to be loaded into automo-

tive trucks and hauled to a central screening and crushing plant located at a low elevation in the west end of the pit and from this plant it was to be elevated by means of conveyor belts to the surface loading bin where it would be loaded into railroad cars.

Plant is Compactly Arranged

Due to the very limited space available in the pit, the plant had to be small but very compact to accommodate the various feeders, screen, crusher and rock rejects disposal chute for loading rejects into trucks. The lower 12 ft. of the building has walls of reinforced concrete 12-in. thick and the upper part is of steel framework covered with galvanized corrugated sheathing. The upper section also contains a 5-ton capacity traveling crane.

The plant equipment consists of a 50-ton capacity crude ore hopper into which the trucks dump their loads. From this hopper the ore is fed by a 48-in. by 13-ft. 9-in. pan feeder having heavy manganese pans and traveling at 18.6 ft. per minute. As the ore leaves the feeder it drops onto a 5-ft. by 12-ft. scalper vibrating screen having a 3/32-in. throw, and a speed of 1,200 r.p.m. This is set at an angle of 15 degrees. The screen has a man-

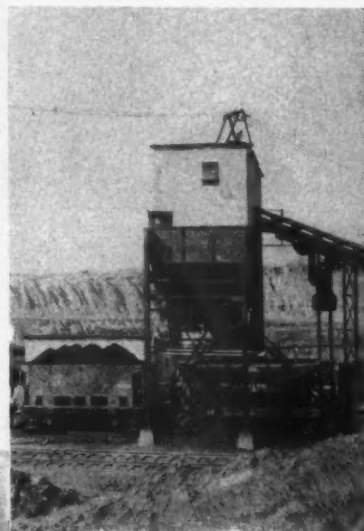
pass through the screen are fed onto a short belt conveyor by a 36-in. by 8-ft. apron feeder having a speed of 34.6 ft. per minute. As the conveyor moves past the crusher, the crushed material is fed on top of the fines by a 36-in. by 8-ft. apron feeder having a speed of 18 ft. per minute. This feeder is located directly under the crusher and handles all of the crushed material. The waste rock or rejects are fed from the rejects chute into dump trucks by one 36-in. by 14-ft. apron feeder traveling up a 12½ degree slope at a speed of 24.7 ft. per minute. The short plant conveyor is 30-in. wide by 50-ft. long and carries the ore from the plant to the main conveyor line. It travels at 400 ft. per minute, having a carrying capacity of 625 long tons per hour. It elevates the material 12 ft. and discharges onto the first flight of the conveyor line. All of the feeders in the plant travel at speeds that will produce the full rated capacity of 625 long tons per hour.

Conveyor Line and Loading Bin are Arranged for Complete Protective Control

The main conveyor line is in 3 sections of approximately 320 ft. centers each. The angle is 18 degrees from

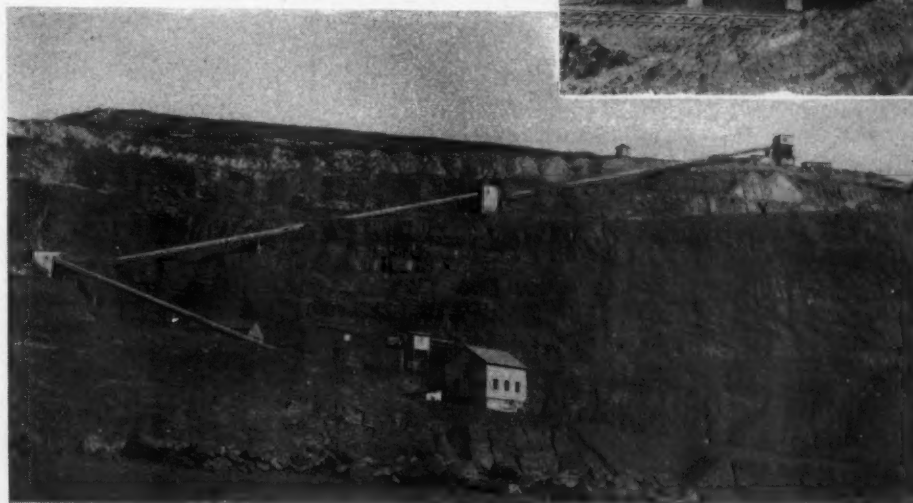
turn rollers, head shafts, tail pulleys, snubbers and take-ups were specified to have anti-friction bearings.

The conveyor line receives the ore from the plant conveyor through a "V" notch opening at an angle of 90 degrees and the first flight discharges onto the second flight at an angle of 69 degrees, while the next transfer is made to the third flight in the line of travel and finally is discharged into the 100-ton capacity loading bin from which the ore is loaded into railroad



Top view:
Ore bin at top
end of conveyor

Ore from the
trucks enters the
crushing plant,
and is fed to a
three-section
conveyor set at
18 degrees to
the horizontal



ganeese steel plate deck with 4-in. square holes through which the minus 4-in. material passes to a hopper below; the plus 4-in. material is discharged onto a reversible 36-in. by 14-ft. apron feeder traveling at 18 ft. per minute. This feeder was made reversible in order to permit feeding the ore chunks to the crusher or the rock to the rock chute.

The crusher is a Pioneer, jaw type, 24-in. by 36-in. with a 4-in. opening, operating at 250 r.p.m. and is driven by a 75 hp., 1,175 r.p.m. motor through "V" belts. The fines that

the horizontal, speed is 400 ft. per minute, gravity take-ups and the frame work, supports and transfer houses are of steel supported on concrete piers. Each conveyor is driven by a 100 hp., 900 r.p.m., 2,200 volt motor through a Falk 9 HA herringbone speed reducer with a chain drive to the head shaft. The back-stop or braking equipment on each conveyor consists of a band brake on the head shaft and one thruster brake on the extended motor shaft. In order to have a very efficient operation with low power costs, all belt carriers, re-

cars for shipment to the lake ore docks.

The loading bin has three 24-in. by 36-in. air operated double gates, air operated spill guards, straight air valves for controlling the cars through long hoses as they are spotted under the bin for loading. Inside of the bin is a float switch that automatically and instantly shuts down both the plant and conveyors in case the bin becomes so full as to endanger the belt. A signal system between the loading bin and the plant makes for perfect control, also all of the operations are



JOY 14 BU LOADER

The powerful, strong, individual gathering arms are the real feature, and the secret of the success of this dependable, fast loading equipment. Fully automatic, electric control for the arms, caterpillar treads and conveyor is a feature of this 36" high, rugged, heavy duty machine. Loads up to five tons per minute.

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FOR HARD ROCK



STRESS TESTED

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**Your fullest protection against
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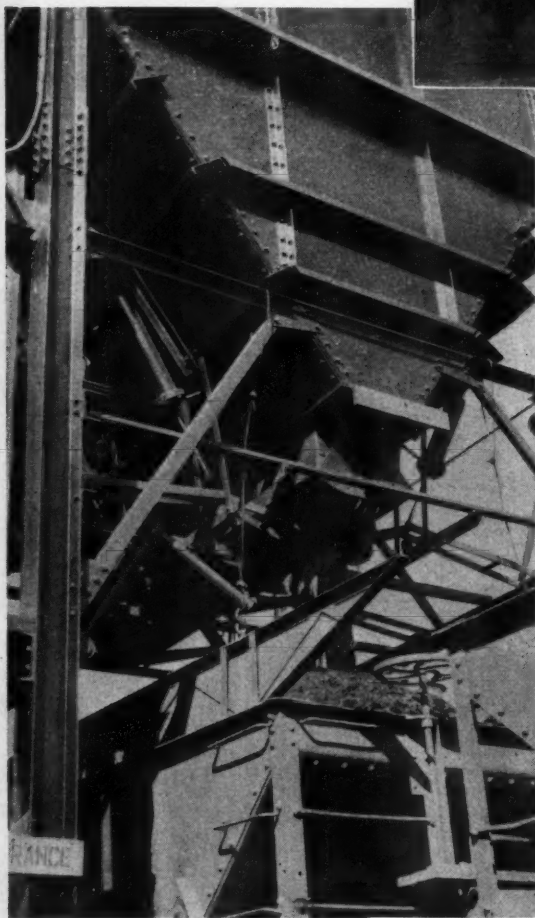
JOY LOADERS *are engineered correctly
to meet any requirement of the job!*

JOY LOADERS *are designed for quick,
efficient servicing under all conditions!*

*Consult a
Joy Engineer*

in proper sequence both in starting and stopping. For convenience when necessary, each conveyor motor can be run independently by means of jog switches located near each motor.

In order to simplify the plant operation and for greater convenience, all plant operations are controlled from one push button control panel having indicating lights on each push button. All of the operations in the plant, as well as starting and stopping the conveyors, are controlled by the operator who is stationed in the plant on a plat-



Spill guards at the loading bin avoid the annoyance of excessive track cleaning

Thirty-five tons of ore at a time are dumped from the side dump trailers

form from which he can view every unit, gauge the product and speed of production.

Electric power for the installation is purchased from the Minnesota Power and Light Co. at 22,000 volts, transformed to 2,300 volts for the conveyor



Loading and haulage combination is selected to provide maximum efficiency

motors and electric shovels and further transformed to 440 volts for the plant motors, blast hole drills, and the air compressor used at the loading bin.

Hauling Units Picked for Special Needs

The truck units that haul ore from the shovel to the plant are 16 cu. yd. capacity side-dump trailers coupled to Walter Four Wheel Drive tractor trucks powered with 235 hp. Waukesha butane-burning engines. The trucks used in hauling waste or rejects from the plant are Walter Four Wheel Drive tractor trucks, of 12-yd. capacity with

end-dump bodies. In selecting the type of trucks to be used, the large capacity side-dump trailers were adopted because of the time to be saved in making only one stop in the line of travel when dumping, and because of the larger tonnage hauled per driver and per unit, large brake drum area was important too, because many of the loads would be hauled down an 8 percent grade. Actual use of these units in the mine has shown the soundness and value of the selection. The end-dump trucks were selected primarily to haul rock rejects from the plant to the waste pile, to supply additional capacity if needed, to build roads, dumps, etc., and have proven to be excellent units for these purposes.

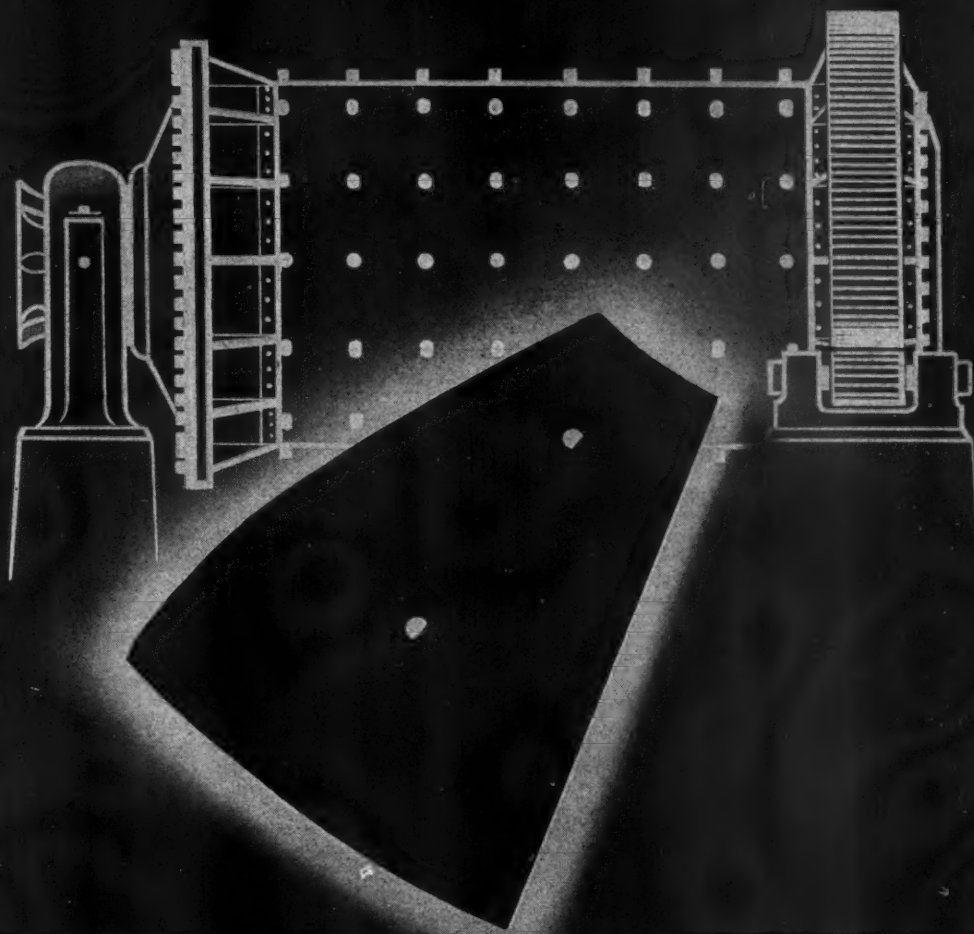
Actual Operations Called for Solution of Many Interesting Problems

The new installation operated the full 1943 ore season, fulfilled every expectation and gave surprisingly little trouble, considering the fact that the men were not familiar with this type of equipment. A few holes

(Continued on page 46)



**Molybdenum cast steel mill liners outwear
Hadfield manganese steel. We have the proof.**



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DATA ON MOLYBDENUM APPLICATIONS.



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The Battle Of Tempo R

No Essential Change is Foreseen in Normal Use Relationship of Common Metals After the War

THE Battle of Tempo R is not a battle of World War II but a battle taking place among the common metals, and Tempo R merely refers to a temporary building that houses most of the metal divisions of the War Production Board.

While temporary building R is well known to a large number of manufacturers and producers who have had occasion to visit Washington during the past several years in search of assistance on metal problems, it is not known that the friendly rivalry among metals has developed into a feud which at times can be likened to a battle. The underlying reasons for this situation are the result of recent developments beyond the control of the War Production Board and may be explained as follows:

In the months preceding Pearl Harbor, our supply of the common metals such as iron and steel, copper, zinc, lead, aluminum, tin, and magnesium was adequate for peacetime needs but demands of a rapidly expanding War Production Program made it imperative that many so-called normal civilian uses of these metals be either prohibited or severely restricted. No one took issue with the necessity for such action, or the possible effect upon "normal" operations.

Now, however, with the recent success of our armies in various theaters of war, certain war programs have been curtailed or adjusted so that in general the supply situation in regard to most metals has been eased considerably. But this easing has not been uniform. Certain metals and particularly certain forms of these metals are still in short supply whereas others are in such easy supply that a substantial tonnage of these can be released for civilian use. Copper and nickel are examples of the former and aluminum and magnesium are examples of the latter.

As a result, the metals in easy supply find themselves in a very advantageous position to develop and possibly enter post-war markets that would normally employ another metal still in short supply. Naturally each metal is anxious to preserve its normal markets and position as regards tonnage consumed and resists competition from other metals insofar as possible. For example, many regular or normal uses of iron and steel, copper, zinc, and lead have been converted out of necessity to one of the "light" metals and the question is will these normal uses ever be regained?

This is a difficult question to answer—undoubtedly some normal uses of certain metals will never be regained—but based upon almost three years experience in the War Production Board on problems of substitution of one metal for another, it would appear that contrary to popular belief the normal or pre-war use position or standing of our common metals will continue after the war with little real change.

The possibility of plastics replacing many of our common metals has also been considered with some apprehension by many metal men and while ad-

TABLE NO. 1—RELATIVE IMPORTANCE OF SOME OF THE COMMON METALS AND PLASTICS (based upon use in short tons)

Pre-Pearl Harbor	Present War Period
1. Iron and steel	1. Iron and steel
2. Copper	2. Copper
3. Zinc	3. Aluminum
4. Lead	4. Zinc
5. Aluminum	5. Lead
6. Tin	6. Plastics *
7. Plastics *	7. Magnesium
8. Magnesium	8. Tin

* Includes synthetic resins used for protective coatings since such coatings actually compete with metallic protective coatings.

mittedly plastics would appear to have by far the best post-war opportunities, their physical properties would have to be changed materially and their use expanded many times before they would have any real effect upon normal metal markets.

In Table No. 1 some of our common metals are grouped along with plastics in order of their importance or use in short tons before Pearl Harbor and during the present war period. No startling changes have occurred other than aluminum which has advanced from fifth to third place and tin has dropped from sixth to eighth place. Both of these changes, however, are due to peculiar wartime developments and not the result of aluminum entering new fields or the replacement of tin by other metals. The expanded use of aluminum can be accounted for almost entirely by its use in an unprecedented aircraft program whereas the decreased use of tin is merely the result of our inability to obtain sufficient supplies to meet normal needs.

In other words while there are many instances where specific normal applications of a particular metal have been changed because of wartime



By R. L. WILCOX

Chief, Metals Branch Conservation Division
War Production Board

necessity to other metals, the over-all effect upon any particular metal's extent of use has been small. Metal producers have viewed such individual changes out of their metal to another metal with considerable alarm, but have neglected changes from other metals to their metal and particularly that the net change has been negligible.

A few examples of wartime substitutions from one metal to another that have contributed to the feeling of anxiety among metal producers are discussed in some detail as follows:

1. Use of plain carbon steel with metallic and non-metallic protective coatings in place of stainless steel, monel metal, etc.

This type of substitution has been fairly extensive and a good portion of this should continue after the war since manufacturers have learned that for many applications protective coatings provide satisfactory protection at reasonable cost. However, in some cases manufacturers have also learned to their sorrow that where severe service conditions exist it is cheaper in the final analysis to use the best possible materials. As a result more extensive use of both plain carbon steel with protective coatings and stainless materials will take place in the post-war period.

2. Use of malleable and gray iron sand castings in place of non-ferrous sand castings—particularly copper base alloy castings.

This type of substitution has also been quite extensive but practically complete resubstitution can be expected the minute non-ferrous metals become available because of ease of casting and lower machining costs. Admittedly, a few normal uses of non-ferrous alloys will never return for in some instances manufacturers have found that entirely satisfactory and

even superior performance could be obtained at lower cost with ferrous castings.

3. Use of electrolytic tin plate in place of hot dip tin plate.

This substitution has proved satisfactory for most food and even milk packing applications and should continue after the war since there is a decided saving when electrolytic tin plate with a coating of 0.5 to 0.75 lb. of tin per base box is used instead of hot dip tin plate with a tin coating of 1.25 lb. of tin per base box.

4. Use of aluminum in place of copper for electrical power transmission.

While this type of substitution has not assumed any significant tonnage proportions, present war experience has been fairly satisfactory and this is one substitution that could become more extensive after the war. However, copper still has many desirable physical properties in addition to electrical conductivity that will make it difficult for aluminum to make too much headway in this market.

5. Use of aluminum and steel in place of copper base alloy free-cutting screw machine rod.

This type of substitution has been fairly extensive and while resubstitution to copper base alloy should be quite general because of superior over-all machining characteristics, the use of aluminum alloy rod, particularly that containing bismuth should gain favor after the war where weight and other properties of aluminum are desirable.

6. Use of low tin solders in place of high tin solders.

This substitution out of necessity has been fairly extensive, but resubstitution to normal solders will take place in most cases just as soon as sufficient tin is available. However, for a few specific applications as for example, side seam soldering of food and milk cans, the present use of solders containing less than 5 percent tin in place of solders containing 35 to 45 percent tin will no doubt continue because this substitution has not only proved entirely satisfactory but also permits a significant saving in cost.

7. Use of zinc, aluminum, and magnesium alloy die castings in place of other non-ferrous and ferrous sand castings or screw machine products.

Substitutions of this nature have been fairly extensive—particularly the substitution of die castings in zinc, aluminum and magnesium for steel and copper base alloy screw machine products. While the majority of these substitutions has been in various types of munitions components, favorable experience, as regards dependability

of the die casting alloys and savings in materials, labor and cost, gained during the war will unquestionably encourage the extended use of die castings in post-war products.

Competition among the metals commonly used for die casting is not as keen as is imagined since each metal has its particular physical attributes that dictate its use under given conditions. For example, the greater castability and ease of finishing of the zinc base alloys if off-set by weight advantages of aluminum and magnesium.

8. Use of aluminum and magnesium sheet and strip in place of steel and other non-ferrous alloy sheet and strip.

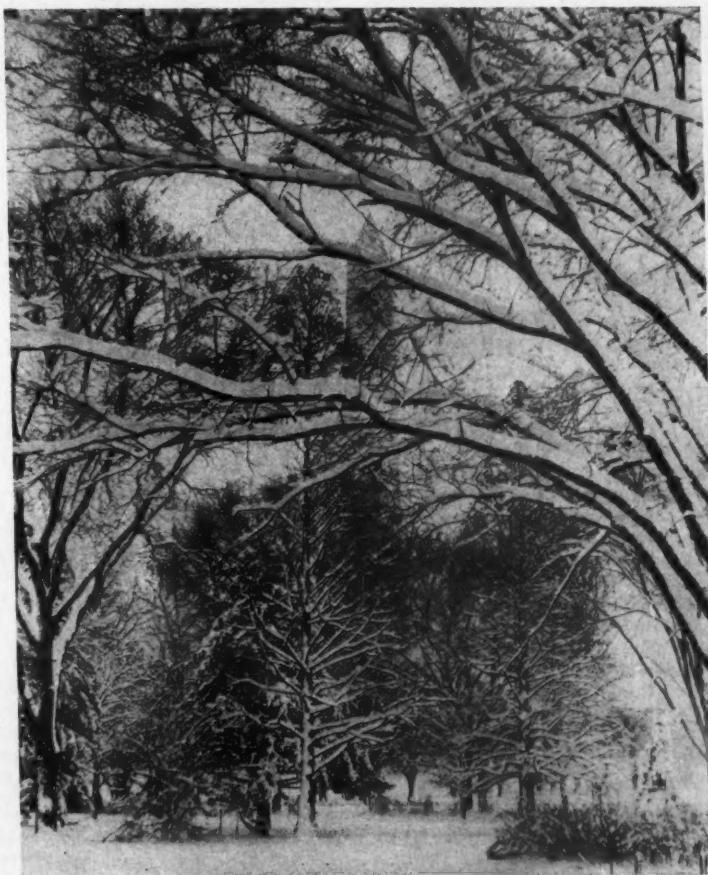
This type of substitution has not been as extensive as generally supposed. Admittedly, large tonnages of aluminum and magnesium in sheet and strip form are being used during the war period but this is almost entirely due to our unprecedented aircraft program, the success of which demanded certain physical properties of aluminum and magnesium regardless of any other considerations.

Actually very little aluminum and magnesium sheet and strip has re-

placed "normal" applications of steel or other non-ferrous alloy sheet and strip, even in specific wartime applications such as airplane landing mats where redesign in steel provided greater strength with but a small weight differential.

Unquestionably, greater use of aluminum and magnesium sheet and strip will take place in the post-war period but not to the extent visualized by the average individual. For example, widespread use has been visualized in the field of transportation for railroad passenger and freight cars, passenger automobiles, buses, and automotive truck trailers. Here, again, the use of stainless steel and low alloy steels, with proper design, will provide equal or greater strength with practically the same weight saving at probably lower cost.

To sum up, from the foregoing few examples, it would appear that in general there have been few major changes out of one metal into another during the present emergency, and where this has occurred it has been the result of wartime necessity and the normal use of relationship of the common metals in the post-war period should remain essentially the same as in the pre-war period.



The Washington Monument in winter

Experiment in Rehabilitation



Gleneagles offers quite a holiday for men who have never lived in such a place before. Most of them return home with many pleasant memories

By **JOE CORRIE**
Glasgow, Scotland

One of the Most Important Matters Recorded in Great Britain's White Paper on the Coal Industry was that of Getting Injured Men Back to Work. The Luxurious Gleneagles Hotel has thus Become a Successful Fitness Center for Injured Scottish Miners

PRIOR to the war, one of the saddest sights to be seen in the mining villages of Scotland was that of the miner who had been injured at his work and who was gradually resigning himself to life-long unemployment.

Perhaps the injury which had incapacitated him had not been a very severe one—a broken arm, or leg, or perhaps an attack of rheumatism contracted through working in a wet pit. But because of the economic conditions, his injury was neglected, and often he gradually became a useless member of society. Visions of such men came to my mind very vividly as I passed through the beautiful county of Perthshire the other day on my way to visit Gleneagles. Thirty-two years of my life have been spent in the coal fields.

In the years before the war, Gleneagles in summer time, was always news to the society press, for it was here that the London, Midland and Scottish Railway Company built one of its most luxurious hotels. It stands in a fresh open countryside, with beautiful vistas of green fields and woods, moorlands, mountains and glens. Its golf courses became famous; its tennis courts were the studios of photographers of the press; and its colored gardens and shady pools heard conversations that made world news. It was a favorite resort for the notabilities of society—people of finance, politics, sport, the theatre and film world.

Now a Haven for Injured Miners

But war has changed its customers. The people who go to stay at the hotel now are ordinary everyday folk, not famous, not hard to please. They carry their own baggage, and their ambition is to get well. For the guests at Gleneagles now are injured Scottish miners; and the hotel has become a rehabilitation center.

When Britain's Government issued a White Paper on the coal industry, one of the most important matters recorded was that of getting injured men back to work in the shortest possible time. So the Department of Health for Scotland chose Gleneagles Hotel for this purpose. It was soon

Right: Facilities for foot and ankle treatment are excellent



converted and now there is accommodation for 200 men.

The average duration of treatment is about six weeks. Already about a thousand men have undergone treatment and many of them have gone back to their original jobs. Most of them, too, have gone back home with happy memories, for it is more than a curative center—it is quite a holiday for these men who have never lived in such a place before, nor had opportunity to recuperate in such beautiful surroundings.

When I arrived in the grounds, the first thing I saw was a group of men of all ages, stripped to the waist, and colored as brown as a nut, playing in

Right: A fully equipped gymnasium with well trained staff is a major feature



★

Exercise in the open. The clean fresh air and beautiful surroundings play a big part too



the sunlight with a football. One could see from their faces that they were having the time of their lives. It was a game they were playing, but a game with a purpose, to exercise the limbs and joints and muscles that were defective. Remedial exercise, it is called.

The Miner's Improvement is Indicated by Various Means and His Interest Aroused in His Recovery

Inside the center there was much activity. Various groups under expert instructors were undergoing exercises, and many appliances were in use which were fascinating as well as curative. A group of men with leg defects lay on mattresses, raising and lowering weights attached to a rope which went round a pulley above them and was attached to their ankles with a leather strap. Extra weights could be added by the patient as the limb



As the days go by, definite improvement in physical well being takes place

grew stronger. And in this way he knew when he was getting stronger, and that the exercise was the proper treatment.

There were others on cycles without wheels which were bolted to the floor. As they pedalled, a pointer on a dial in front of each one told him how far he had gone, and how fast he was going. Day by day he could go further and faster, and so he became interested in his recovery. There was a little boat with oars attached where he could sit and row and gain exercise that way.

There were special appliances for those whose backs had been injured. And as they gradually improved under this treatment they went outside and were given shovelling work to do. When I was there they were mixing concrete and making curb stones for the local County Council. Another group sat in a circle, undergoing foot exercises under a specialist. And

there were others in a shed making camouflage nets to exercise the fingers and the wrist.

In a workshop there was a large group at work-benches making book-cases, games and such things as wooden dolls; some were working with saws, and planes, and gimlets. It was all very intriguing to these men, many of whom had never done any woodwork before.

Relaxation and Freedom from Worry are Watchwords

The bulk of their day is taken up with these occupational exercises, but in the evenings they are free to do as they please. They can dance in the famous ballroom. They can laze in the comfortable lounges. They have cinema shows and concerts and often provide their own entertainment. For example, one miner from Ayrshire had brought his fiddle with him. They have table tennis, billiards, darts, and

other indoor games, while outside they have the golf courses, the tennis courts, and the bowling greens on which to enjoy themselves.

They have formed a committee too—a new chairman is appointed every second week—to discuss their own welfare and submit their suggestions to the doctor in charge. These suggestions always get a sympathetic hearing.

Each man gets home every second week-end, and his railway voucher is provided by the Miners' Welfare Commission. This commission is maintained by a levy of one halfpenny a ton of coal raised from the mines in Britain, and covers the whole of the welfare schemes of the industry.

There is no charge made for treatment, but as these men are only receiving workmen's compensation for their injury, and have home commitments, they are not rich by any means. Perhaps in time they will be better provided for in this respect, for freedom from home worries will always effect a quicker cure, and make the visit to Gleneagles even more a holiday. Then there is the after-treatment problem which has not yet been solved. Many of the men when they leave the center are recommended for light work only. But there are few jobs of that character about a coal mine and most mining districts have no other industry to absorb those who are not fit for severe physical work. And yet, if the treatment at Gleneagles has to be lasting, the man must get into employment. Perhaps the setting up of a light industry will have to be considered.

There are also compensation difficulties yet to be solved. Also a better system of contact between the pit and the fitness center to plan for an avoidance of the common type of accidents which are now known at the center. These things, no doubt, will come in time. But this fitness center is now well-established and has been a boon and a blessing to thousands.

Webb Pit

(Continued from page 40)

were punctured in the long endless conveyor belts, but these were mended and vulcanized at the first opportunity with a 12-in. by 15-in. double plate portable vulcanizer. Sticky ore gave some trouble at first by building up on the return carriers, snub pulleys and take-ups, but this source of trouble was soon minimized through the installation of suitable scrapers, and by dumping alternate loads of dry and sticky material into the crude ore hopper. There is no gallery or house built to house the conveyor because structural material was not obtainable at the time. Rather than house the expensive and vital conveyors in

a wooden structure, the belts were covered over with hinged half sections of corrugated culvert material of heavy gauge steel which are held in place with snap hooks and easily lifted for belt inspection.

In view of the general experience of other conveyor users, we were naturally apprehensive as to what would happen at the 90 degree and 69 degree transfer points. The transfer chutes were specified to be made of ¼-in. plate with lining plates of ½-in. material. Careful watching when the conveyors were first used disclosed where the chutes should be changed in shape to prevent plugging when handling sticky material or belt injury when handling sharp crushed material. When these corrections were made, the chutes were then lined with

20-lb. rails with the balls of the rails acting as the wearing surface. This type of lining has proved to be very satisfactory for transfer point service. It is found that only a portion of it has to be replaced after handling approximately 600,000 tons of ore.

The crushing and screening plant equipment and building was supplied by the Pioneer Engineering Co., of Minneapolis, through the Wm. Ziegler Co. The conveyor machinery and supporting structure was supplied by the Chain Belt Co. of Milwaukee; the belts are one each of Goodyear, Goodrich and U. S. Rubber Co. All of the electrical equipment was supplied by the General Electric Co. All construction and installation work was done by the Snyder Mining Co.

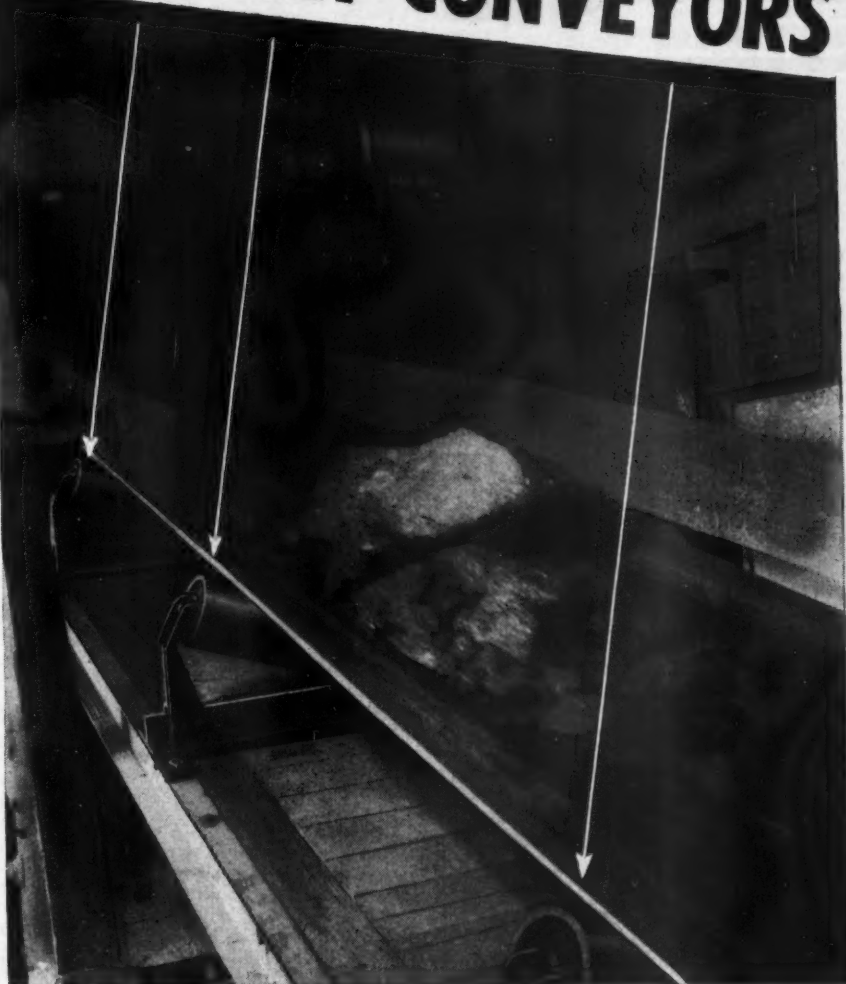
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WHEELS OF GOVERNMENT

As Viewed by A. W. DICKINSON of the American Mining Congress

SETTling into a steady pull soon after reconvening on November 14, the Congress has now sent to the White House the Second War Powers Act extension authorizing continuance of WPB, OPA, WMC, and other emergency activities, as well as the Flood Control bill providing for approximately one billion dollars in post-war projects. Also now on the President's desk is the Doughton bill freezing Social Security taxes at 1 percent each on employers and employees for 1945, and over which a battle impends in the event of a White House veto.

Interesting to mining men are some of the Senate and House Committee changes which are due in the organization of the incoming 79th Congress in January. Senator Elbert Thomas of Utah is expected to take the chairmanship of the Committee on Military Affairs, while the chairmanship of his Committee on Education and Labor is expected to go to Senator James Murray of Montana. On the Finance Committee, Senators Abe Murdock of Utah and Ernest McFarland of Arizona have been mentioned as possibilities for the majority seat vacated by the defeat of Bennett Champ Clark of Missouri. There are also two minority memberships on the Finance Committee vacated by the defeat of Senators James Davis of Pennsylvania and John Danaher of Connecticut.

On the House Committee on Ways and Means, Rep. Clinton Anderson of New Mexico is an active candidate for the majority seat vacated by Rep. Wesley Disney of Oklahoma. For the two minority seats on this committee vacated by Treadway of Massachusetts and Dewey of Illinois there are no announced candidates.

Security Tax Freeze

On the proposal to freeze the Social Security payroll tax at its present level for the fourth time, again advanced by Senator Vandenburg of Michigan, there was enough desire for the "freeze" on the part of House

members to initiate action in the regular order through the revenue-producing Committee on Ways and Means. The extension bill introduced by Chairman Doughton was passed by the House, 262 to 72, and shortly thereafter by the Senate, 47 to 19. Whether the President will veto the Doughton bill and if so whether the Congress will pass it over his veto remains a matter for conjecture.

The fact remains that as of today the payroll tax of 1 percent from employees and 1 percent from employers not only produces approximately seven times the present total outgo, but the Old Age Survivors Insurance Trust Fund now stands at nearly six billion dollars and is increasing rapidly. It is strongly argued that a large increase in the excess of income over payments could readily result in encouraging raids on the Fund, either for purposes entirely apart from Old Age Assistance or for increases in benefits and coverage which could not in the long run be supported.

Tax Outlook

The chairmen of both of the revenue raising committees in Congress, Senator George and Rep. Doughton, have been quoted recently as believing that very little tax change is in prospect that will bear upon 1945 income. Ways and Means Committee Chairman Doughton has stated that "the war need for revenue has not changed. It looks to me like we had better go along as we are until we get further light on future revenue needs. More revision at this time in my opinion would mean more uncertainty to business." Sen. George has expressed his firm desire for the lowering of taxes and Government costs and beginning of the liquidation of the national debt following the war and his belief that high taxes will slow down business enterprise.

Roy Blough, director of the Treasury Division of Tax Research, believes that no objection will be offered to removal of the excess profits tax, and

Washington Highlights

CONGRESS: Preparing to wind up 78th Session.

PAYROLL TAX: Frozen at 1 percent for 1945(?)

INCOME TAX: No decrease in sight for next year.

STEEL WAGES: WLB makes "fringe" awards.

STATE LAWS: Arkansas and Florida outlaw closed shop.

GAS: Federal Power Commission investigating natural gas industry.

ST. LAWRENCE: Senate rejects Aiken rider to Rivers and Harbors bill.

PREMIUM PRICES: Plan to be extended.

SILVER: Green Act extension approved.

that the repeal of the capital stock tax and the declared value excess profits tax is also desirable following the termination of hostilities. He also strongly favored simplification of all taxing procedure.

Steel "Fringe" Awards

In late November the A. F. of L. members of the War Labor Board suddenly dropped their insistence that the first action on the steel wage demands should be abrogation of the Little Steel Formula, and again joined the Board in its deliberations. Quickly thereafter the Board brought out its decision under which the "fringe" demands for shift differentials, liberalized vacations and dismissal or severance pay were granted, to the extent of a premium of 4 cents an hour for the second shift and 6 cents an hour for the third shift, with one week's vacation with pay for one year's service and two weeks' vacation with pay for five years or more of service. A limited form of severance pay to be developed by collective bargaining was also given approval.

On the guaranteed annual wage, it was recommended that a special commission be appointed to give the subject careful study. Denied was the demand for the removal of geographic wage differentials as well as the demand for "equal pay for similar work throughout the industry."

Still up to the White House is the

17 cents an hour increase which would break the Little Steel Formula. The "fringe" awards (estimated by some as an average 5 cents per hour wage increase) are not effective until the OPA renders a finding that no price increase is required, or until Director Fred M. Vinson of the Office of Economic Stabilization gives his approval to such increases as OPA may report are required.

Related to the Steel Wage cases, on which hang potential nation-wide wage increases, is the pending resolution by Senator Pepper of Florida under which any wage below 65 cents per hour would be recognized as substandard by WLB. WLB Chairman Davis has stated that a 65-cent minimum, in addition to bringing a four billion wage increase to the nation, would lead to demands for wage increases on up the line from semi-skilled and skilled workmen.

State Labor Laws

Prohibition of the closed shop by constitutional amendment, approved in the November election in Arkansas and Florida, and Arkansas' outlawing of WLB's "maintenance-of-membership" clause requiring a union member to maintain membership throughout a contract agreement unless he withdraws it during the "escape period" of 15 days, struck fire in WLB and AFL circles this month. In a formal opinion the general counsel of WLB stated that no employer or labor union would violate a State law in fulfilling a "maintenance-of-membership" directive, and AFL's general counsel assured his delegates at the New Orleans convention that closed shop contracts in Arkansas and Florida war plants "are entirely safe" and that "the moment there is a dispute the War Labor Board will take jurisdiction and tell the State to keep hands off." Concern is apparently mounting in AFL circles because of labor laws which have been enacted in very recent years in Alabama, Colorado, Idaho, South Dakota and Texas, as well as Arkansas and Florida.

Natural Gas Use

In its investigation of the Natural Gas Industry now getting under way, the Federal Power Commission is receiving assistance from Senator Overton of Louisiana, who has introduced a resolution authorizing an appropriation of \$100,000 for the work and directing the FPC to report the results of the investigation to Congress, with particular respect to:

(1) The extent, location, and availability of the known natural-gas reserves and the effects of the present and anticipated depletion thereof; (2) the nature, amount and location of the present and anticipated utilization of natural gas, the resultant economic waste and undesirable competition with and displacement of other fuels,

and the feasibility of converting natural gas and its constituent hydrocarbons for chemical and other superior uses; (3) such other matters relating to the production, transportation, distribution, sales, and utilization of natural gas as may be helpful to the Congress in determining what additional legislation, if any, should be enacted for the purpose of restricting unnecessary waste or depletion of natural-gas reserves or the utilization of natural gas for inferior or otherwise undesirable purposes in competition with other fuels.

St. Lawrence "Treaty"

Sen. Aiken of Vermont, in pressing for passage of his bill which would approve the St. Lawrence Waterway and Power Project as an executive agreement, ran afoul of a goodly number of the members of the Senate who either did not approve of his bill, or else did not wish to have it attached as a rider and thus jeopardize enactment of either the Flood Control or the Rivers and Harbors bills. Sen. Overton's (Dem., La.) Commerce Subcommittee held hearings at which the majority of his members took definite exception to the State Department's position that the St. Lawrence Project need not be considered as a treaty, and Chairman Bailey (Dem., N. C.) of the full Commerce Committee stated pointedly that he intends ultimately to ask the Senate to transfer custody of Aiken's bill to Sen. Connolly's Committee on Foreign Relations.

In appearing at the hearing, Dr. Edward Borchard of Yale University, representing the National St. Lawrence Project Conference, declared that the project "is of such magnitude, recorded form, executory character and continued obligation, both for Canada and the United States, that it can be carried into execution by treaty alone."

Senator Aiken moved to attach his St. Lawrence Project measure as a rider to the Omnibus Rivers and Harbors bill but after several days of debate the Aiken amendment on December 12 was rejected by a vote of 56 to 25. This vote came despite a telegram from the President stating that he desired approval of the Project.

Premium Metal Prices

While for some time there have been rumors concerning possible modification of the Premium Price Plan for copper, lead and zinc, it now appears that the entire matter may be held in abeyance until such time as the military production schedules for the production of ammunition and other essentials are safely met. As indicated by Metals and Minerals Vice Chairman Philip D. Wilson at El Paso, the War Production Board takes the position that it has the right to cancel the "B" and "C" and Special Copper premiums on 30 days' notice

but feels that longer notice should be given, if and when such action is taken.

At present plans are under consideration to extend the Plan beyond its authorized expiration date of July 31, 1945. Authorization for an extension of six months or 12 months would be requested of the new Congress, which at the same time will probably be asked to lift the restrictions of the Taft amendment to the Stabilization Act, or else make an appropriation in order that premium price commitments made by Metals Reserve Company from June 30 to July 31, 1945, may be met.

Silver

Now before the President for approval is a bill extending the Green Silver Act to December 31, 1945; as originally introduced, the measure called for a two year extension. It will be remembered that this measure makes Treasury silver available for war industrial use and was originally enacted at the behest of Senators from the northeast coastal states.

A recent Treasury announcement states that over 1¼ billion ounces of silver have been put to the following uses: 903 million ounces leased for non-consumptive uses in war plants; 243.7 million ounces lend-leased to foreign governments for coinage purposes and other war uses; 5 million ounces sold from "silver ordinary" stock to industrial users under WPB certifications; 41 million ounces sold under terms of the Green Act of July 12, 1943, in accordance with WPB priorities; and 33.6 million ounces used in coinage of new silver alloy nickels.

A resolution extending the life of the Senate Special Silver Committee offered by the Committee Chairman, Senator Elmer Thomas of Oklahoma has little chance of approval in the present session. The authorization for the Committee expires with the 78th Congress and a new resolution for its re-establishment is expected early in the 79th Session.



Personals

Duncan C. Kennedy, executive secretary of the Kanawha Coal Operators Association, Charleston, W. Va., recently resigned and was named secretary-emeritus. The position has been taken over by his son, **Harry Kennedy**. Duncan Kennedy has held the position for over 40 years and will remain in an advisory capacity.

Frank L. Hornickel, of Cleveland, Ohio, president of Anchor Coal Co., has been named association president succeeding **L. Newton Thomas**, of Charleston. **Daniel W. Morton**, of the Wyatt Coal Co., was named vice president and **John L. Dickinson**, of Charleston, was elected secretary-treasurer.

Association directors elected included **Thomas A. S. Wilson**, of Sharples; **C. W. Connor**, of Montcoal; **Garner Williams**, of Kayford; **F. O. Harris**, of Cannelton; **O. B. Pryor**, of Wheeling; **W. F. Pioch**, of Whitesville; **Mr. Hornickel**, **J. T. Hatfield, Jr.**, of Cincinnati, and **Andrew O. B. Hogue**, of Mahan.

Martin Julian has replaced **J. B. French** in the position of mine superintendent for the Little Butte mine of the New World Mining Company at Globe, Ariz.

A. J. Arnold is now with the Eagle Picher Mining and Smelting Company at its new plant at Sahuarita, Ariz. He was formerly mill operator for the Tennessee Schuykill Corporation at Chloride, Ariz.

New officers of the Lando Coal Corp., Lando Mines, W. Va., are announced: **C. L. Fishback**, of Columbus, Ohio, is chairman of the board; **Frank P. Smith**, of Huntington, W. Va., is president; and **Herbert L. Thompson**, Cincinnati, Ohio, is vice president and treasurer.

Thomas Matchett, president, Robins Conveyors, Inc., Passaic, N. J., has announced three new appointments: **Harold E. Murken**, controller and assistant secretary; **T. Webster Matchett**, secretary; and **John T. Hoyt**, treasurer. All have been with Robins for some time.

Arthur J. Yahn has become general superintendent for the St. Louis Smelting and Refining Co. at Fredericktown, Mo. He was formerly mill superintendent of the Shenandoah-Dives Mining Co.

Edward Steidle, dean of the School of Mineral Industries, Pennsylvania State College, will again go to South America as a representative of the



United States section of IPIMIGEO. A survey of what has been done since this international congress of mining men met in 1942, will be made. Over 80 members are now listed in this country.

Ott F. Heizer, who retired recently from active duty with the Nevada-Massachusetts Company and the Rare Metals Corporation, has moved to Los Altos, Calif.

Luis Jordan, formerly of the engineering department of Island Creek Coal Company, has joined the staff of the engineering department of the Rail and River Coal Company, Bellaire, Ohio.

Allan W. Walter, controller of the Freeport Sulphur Company, New York City, has been elected to membership in the Controllers Institute of America.

A. F. Whitt, formerly general superintendent at Lillybrook Coal Company, Affinity, W. Va., has been named chief engineer of the Rail and River Coal Company, Bellaire, Ohio.

R. L. Wilcox, chief of the Metals Branch, Conservation Division, War Production Board, resigned as of November 1 to return to his position with the New Jersey Zinc Company in Chicago.

Clifford J. Murdock, deputy state mine inspector for 16 years under the late Tom C. Foster, has been elected to the office of mine inspector in recent elections. Formerly a resident of Mayer, Murdock has been in Arizona for 35 years. He is an experienced miner with former employment with a number of state mining companies.

At a meeting of the directors of the Vulcan Iron Works held November 21 in the company's offices at Wilkes-Barre, Pa., **H. R. Pittman** was appointed treasurer; following the resignation of **W. W. Moss**. Mr. Pittman has been connected with the Vulcan Iron Works for 27 years, serving successively as chief clerk, comptroller, and in recent years as both assistant secretary and assistant treasurer.

J. C. Perkins, manager, Northumberland Mining Co., Fresno, Calif., has moved to Tonopah, Nev. His new post office address is Box 506.

John W. Crawford, secretary-treasurer of the DeBardeleben Coal Corporation, Birmingham, Ala., has been elected to membership in the Controllers Institute of America.

Dr. L. A. Fox, metallurgist at the Salt Lake City station of the Bureau of Mines, is head of the Bureau's new office at North Carolina State College. A mineral development program for the southern states is being inaugurated there.

Walter Zack has been appointed mine superintendent of the Buckeye Coal Company, at Nemacolin, Pa. Mr. Zack was formerly mechanization engineer for this company.

R. M. Magraw, general manager of Potash Company of America, resigned his position as of November 30. He will continue, however, in an advisory capacity. **R. A. Pierce**, assistant general manager, who pioneered the company's work at Carlsbad, has declined the post of general manager for reasons of ill health. He will remain with the organization on special work. **K. F. Peters**, with the company for several years, was made resident manager as of December 1.

Rodney B. Sprague has gone to South America as assistant geologist for the Cerro de Pasco Copper Corporation. He was formerly assistant geologist for the Consolidated Coppermines Corporation at Kimberly, Nev.

Edward H. Clark has been made chairman of the board of the Homestake Mining Company. He was succeeded in the presidency by Donald H. McLaughlin, a director of the company. Dr. McLaughlin was formerly Dean of Engineering, University of California, and is also executive vice president, Cerro de Pasco Copper Corporation.

Rush B. Gunther, formerly with the Dick-Smith Engineering Corporation, has become superintendent for Gasparini Coal Mining Company at Peckville, Pa.

Harold Hooper, one of the owners of the Alder Creek properties in Idaho, has become interested in a lease on a gold-silver-copper property in Elko County, near Rio Tinto, Nev.

Edwin B. Michal, with the American Smelting and Refining Company at the Corpus Christi, Tex., electrolytic plant, has been transferred to Tacoma, Wash.

Ralph H. Knode, president, Stonegate Coke and Coal Company, who has been a member of the National Coal Association's board of directors since 1930, was recently unanimously elected treasurer of that organization.

M. M. Higbee, of Wallace, Idaho, was recently elected president of the Coeur d'Alene Extension Mines Corporation, replacing George J. Cooper, of Wallace. Mr. Cooper has held the post since 1937. Other officials elected were: Earl Chilcott, of Kellogg, vice president, and E. E. Scott, of Wallace, secretary-treasurer.

Robert Ronk, formerly superintendent at Rapatee, has been appointed general superintendent of the three mines of the Midland Electric Coal Co., operating in Northern Illinois. James McDowell now becomes mine superintendent at Rapatee and Max Wasson becomes pit boss.

Appointment of William P. Michell as assistant chief engineer of Mack Trucks, Inc., has been announced by L. C. Josephs, Mack vice president and chief engineer. Mr. Michell recently returned from Great Britain where he had been serving in an advisory capacity on military truck transport at the invitation of the British Government.

Elmer Williams has been promoted to the position of superintendent of the Delaware and Laffin Collieries of the Hudson Coal Co., Hudson, Pa. He was formerly general mine foreman at the Delaware colliery, and succeeds Patrick O'Hara, who has been promoted to superintendent of tenements and subsidence for the Luzerne-Lackawanna area.

H. C. Weed, formerly assistant mine superintendent, has replaced P. D. I. Honeyman as general superintendent for the Inspiration Consolidated Copper Company at Inspiration, Ariz. Mr. Honeyman was promoted to assistant manager last summer.

A. H. Mandt was recently elected president of the Central Elkhorn Coal Company of Estill, Ky. Mr. Mandt is also vice president and general manager of the Stephens Elkhorn Fuel Corp., Alpharette, Ky. Troy Combs, who is vice president of Central West Coal Co., has been elected a vice president of Central Elkhorn.

Roy B. Earling has been appointed management representative on the Appeals Committee of the War Manpower Commission at Fairbanks, Alaska. He is vice president and general manager of the Fairbanks operations of the U. S. Smelting, Refining and Mining Company.

Ernest G. Brown, general manager of the mechanical goods division, United States Rubber Company, has announced the appointment of Herman A. Everlien as general sales manager of the division, and Walter F. Spoerl as merchandise manager. Both positions are newly created.

James E. Power has been appointed eastern sales manager of the mechanical goods division.

Joseph Hutchinson has become assistant mining engineer for the Pittsburgh Coal Co. He was formerly assistant foreman at the Somers mine. Stanley Radziwon, formerly standards engineer, has been made mine foreman at the Solar mine.

The Timken Roller Bearing Company recently announced appointment of Howard C. Sauer as general manager of its newly-created foreign division, which will handle the sales and service of bearings, steel, and detachable rock bits, in the world market outside the U. S. A. Offices will be in Canton, Ohio.

Emile Crampe, formerly assistant mine foreman at the Isabella mine of the Weirton Coal Co., has become a federal mine inspector.

-Obituaries-

Frank Anderson Merrick, 75, president of the Westinghouse Electric and Manufacturing Company, died October 26 at his home in Hamilton, Ontario. Mr. Merrick graduated from Lehigh University as an electrical engineer in 1891 and for more than four decades



has been associated with the company in positions of increasing responsibility until his retirement last April. He became vice president and general manager of Westinghouse Electric and Manufacturing Company in 1925 with headquarters in Pittsburgh. In June, 1929, he was elected president of the company and nine years later became vice chairman, which position he held until his resignation.

Clarence M. Schwerin, formerly president of the Vinton Collieries Company at Vintondale, Pa., died October 28 in New York City. At the time of his death, Mr. Schwerin was president of the Delano Coal Company and the Schwerin Air Conditioning Corporation. He had been associated with numerous enterprises in which he utilized his ability as chemist and metallurgist. When the Vinton Collieries was reorganized, Mr. Schwerin became a director. His son, Clarence M., Jr., is president of the Vinton Coal & Coke Company.

George Jay, 63, former traffic agent for the Phelps Dodge Corporation, died on October 13, at his home in Tucson, having retired from active service in 1942, due to illness. Upon his retirement, Mr. Jay had completed 29 years of active mining associations in Arizona. He was employed by the Calumet and Arizona Mining Company in 1913 in the purchasing and traffic department, prior to which he had spent several years with the Cananea Consolidated Copper Company at Naco. He continued with the Phelps Dodge Corporation in 1931 when the C. & A. merged with the former.

Howard Gay, 51, secretary and cost department manager of Macwhyte Company, wire rope manufacturers, Kenosha, Wis., and a leader in cost accounting system, died November 23, at Kenosha, Wis., after an extended illness.

Butte Conference on The Securities Act

THE National Small Mine Finance Conference held in Butte, November 10 and 11, has developed a better understanding on the part of the SEC and of state investment commissioners of the problems confronting western mining men during the promotion of small mines and unproved prospects. Members of the SEC, state investment commissioners, small mine operators, the underwriters, mining association officials and others attended the conference at the Finlen Hotel called by Montana's Governor Sam C. Ford. Governor Ford delivered the opening address and Carl J. Trauerman of Butte, who is chairman of the Western Governors' Conference Mine Financing Committee, and manager of the Montana Mining Association, was permanent chairman of the conference. Called for the definite purpose of determining measures necessary for modification of the SEC and state regulations and thus to facilitate the financing of mining operations by the sale of securities to the public, the conference was felt to have substantially attained its objectives.

The attention which the SEC men gave to the subject has led spokesmen for the mineral industry to believe that after 11 years of effort the views of the mining men are finally to receive consideration in a reformulation of SEC policies that may even extend to a few minor changes in the law itself.

The meeting happened to come soon after circulation of a new regulation for qualification of assessable mining corporations and a new form for registration of small companies, which were sent to various mining groups by the SEC with invitations for comment.

The legislative committee of the Northwest Mining Association, headed by Elmer E. Johnston, Spokane mining attorney, and other associations all over the western portion of the United States, had already started study of the new forms when the Butte session was called. The NWMA had also previously adopted a resolution for a Congressional investigation of the SEC and the effect of its regulations on the economic life of the western states and Alaska.

The SEC was represented by eight men, and the investment commissions of seven states were represented. Both of these groups are shown and identified in the accompanying photographs. Trauerman, who is a Butte mining engineer and

manager of the Mining Association of Montana, was chairman of the subcommittee at the San Francisco meeting that drafted the mine financing recommendations.

NWMA had a well-prepared program ably presented by Mr. Johnston; Frank Lilly, secretary of the Prospectors and Mine Owners Association; Leon Starmont; Therret Towles; Ed Lavigne, delegate of the Spokane Standard Stock Exchange; and the following past-presidents of the Northwest Mining Association: Roger Oscarson, James L. Leonard, and Cecil O. Dunlop. Others who presented recommendations and participated in the discussions, outside of the representatives of the SEC and the state investment commissioners, were Harry L. March, Boise, secretary of the Idaho Mining Association; George W. Hallock, Grass Valley, representing the California State Mining Board; and Donald M. Peck, Pioche, Nev. The chairman was also head of the Montana delegation, which included participants Robert P. Porter, Helena; Sidney Ward, Clinton; C. P. Buls, Missoula; John Hickey, Philipsburg, president of the Mining Association of Montana; W. Earl Greenough, Gallatin Gateway; Charles Brazier, Basin; John Collins, Dillon; and W. R. Allen, former Lieutenant Governor of Montana and past president of the Beaverhead Mining Association.

According to figures presented, 13,650 partly developed mining properties will require public financing if they are to go into production, and these projects have tens of thousands of stockholders with a total equity of about \$337,000,000. More than 3,000 western cities and towns that normally depend in part on expenditures for mine development also have an interest in making the reopening of these mines possible, the SEC group was informed.

Oscarson dwelt on the necessity of post-war employment planning, setting forth the position of the Committee for Economic Development as outlined in a recent regional meeting in Spokane.

Sheldon L. Glover, head of the Department of Mines in the Washington State Department of Conservation and Development, stressed the advisability of removing any factors that create sales resistance or raise the cost of financing. He suggested that forms for registration of mining enterprises be available for all types of mining, instead of restricted to metalliferous mines, as the SEC had suggested in its preliminary inquiry.

W. R. Allen emphasized that mining communities and stockholders in dormant mining enterprises have rights that the SEC and the several state commissioners should consider. "Do not crucify the innocent stockholders," he stated, "by drafting rules that make it impossible for the officers and directors of their companies to finish the financing job." He referred particularly to SEC regulations barring companies from use of the \$100,000 exemption if one of their directors has been enjoined in connection with unrelated deals and to SEC regional office directives that prohibit company officials from communicating with their own stockholders relative to possible reorganizations. Allen's motion was adopted



Gov. Sam C. Ford (left), who called the conference and presided at the opening session, and Carl J. Trauerman, mining engineer, permanent chairman of the Butte conference

unanimously. "The prospectors, too, and the miners who will need jobs, have rights. Let's have it understood that we are not here beseeching the SEC and the state officials for privileges. We are part of the public, merely asking for our rights."

The Montana delegation requested that the various state Securities Commissioners consider the proposition of allowing a security fully registered with the SEC to be exempt from all state blue sky laws, and asked the SEC to consider the removal from the front page of the prospectus of information on the commission or cost of selling the security to the public. Both of these recommendations were unanimously adopted, although Allan S. Richardson, Colorado Securities Commissioner and the president of the National Association of State Securities Commissioners, asked that

Left to right: William Scotty Jack, secretary of state of Wyoming, Cheyenne; W. A. Mueller, member of the securities commission of South Dakota, Pierre; John J. Holmes, investment commissioner of Montana, Helena; Sidney J. Coleman, assistant investment commissioner of Montana, Helena. Back row, left to right: Allan S. Richardson, investment commissioner of Colorado, secretary and head of the mining committee of the National Investment Commissioners Association, Denver; E. M. Erhardt, assistant director, department of license, Washington, Olympia; Maurice Hudson, corporation commissioner of Oregon, Salem; Charles H. Heltzel, assistant state investment commissioner of Oregon, Salem; and Ivan T. Crase, state division of corporations of California, San Francisco

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Left to right, those in the picture, front row, are: Benjamin Adelstein, chief mining engineer, Philadelphia; Robert H. O'Brien, commissioner, Philadelphia; Baldwin B. Bane, director, corporation finance division, Philadelphia; and Sumner T. Pike, commissioner, Philadelphia. Back row, left to right: Donald J. Stocking, attorney, Seattle; John L. Geraghty, regional administrator, Denver; Day Karr, regional administrator, Seattle; and Robert E. Landon, mining engineer, Denver



his group be recorded as not voting when these motions were adopted.

Mr. Johnston also requested that the designation of a security as either exempt or registered, etc., also be taken off the first page of the prospectus. This recommendation was not fully concurred in and Mr. Johnston stated that he would discuss that point in a brief to be filed later with the SEC.

While no definite promises were made, as the two SEC members, Robert H. O'Brien and Sumner T. Pike, could not commit the other three, it was indicated that the SEC will consider two changes: raising the limit on permissive exemptions from \$100,000 to \$300,000; and, allowing circulars or advertisements that give some facts about an offering and invite the reader to send for the full prospectus.

As to offerings under the exemptive rules, the principal requests of the NWMA were boiled down to:

1. Eliminate requirements for placing items that create "sales resistance" on the front page of each prospectus or piece of literature.

2. Drop the punitive provisions against men who have been enjoined, as these penalties, it was pointed out, really punish the innocent shareholders.

3. Simplify the accounting necessary under the SEC's proposed drafts in the cases of assessable companies, so as to reduce needless expense.

4. Remove any authority now granted by the SEC to state securities commissioners to interfere with offerings mailed into the state from outside, as long as the offerings have met federal qualifications or registration requirements.

In discussions preliminary to the conference, the idea seemed to prevail that some of the states now assume authority over the United States mail in issues of securities not registered in these states.

Edward P. Ryan of Spokane, who is operating a Montana property, brought the meeting to a close with an inspiring speech in behalf of the rights of the small miner and prospector.

After the conference Commissioner Sumner T. Pike of the SEC of Philadelphia, on behalf of himself and associates, said:

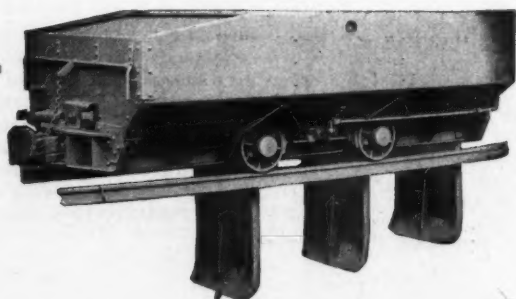
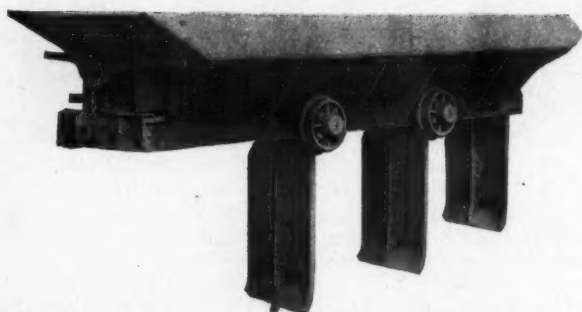
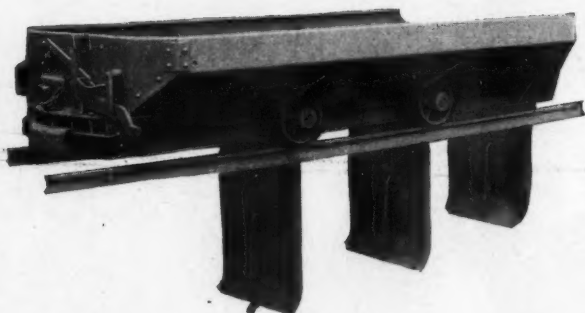
"It is a tremendous pleasure for us to come to Montana and get acquainted with you mining men, underwriters, promoters and others and your problems. We do appreciate the good, solid, hard work which was done in planning and arranging this

conference. We will take back to Philadelphia and Denver the great benefit we have received here.

"The conference has been helpful in bringing about a better mutual understanding of the problems involved in the operation of a law written in general terms.

"I believe that a conference of this kind should be repeated—not right away—but at some future date, as it has proved so helpful to us all. Problems will continue to exist, and in swapping ideas, as we have here, we can clear up some of the things which we cannot clear up by correspondence. It has been a fine and helpful conference conducted throughout in a fine spirit of helpfulness and understanding."

As a result of the meeting, the legislative committee of the Northwest Mining Association has forwarded to the Securities and Exchange Commission at Philadelphia a statement covering the Butte discussions and several other matters that were not reached at Butte because of lack of time. All participants in the Butte meeting were allowed to file a brief on the discussions of the meeting with the SEC at Philadelphia before December 15.



ALL S-D 1-2-3 "AUTOMATICS" Are NOT Alike

But the same remarkable
1-2-3 Automatic principle
is built in every car.

★ Every S-D 1-2-3 "Automatic" mine car is built to meet the particular requirements of the mine using it. Heights, widths, lengths, loading, and dumping conditions and a dozen other problems are involved. This is why our engineers cooperate thoroughly with you before S-D 1-2-3 "Automatics" are produced. It is this thorough engineering job that makes S-D 1-2-3 "Automatic" installations smooth running from the start.

But in all S-D 1-2-3 cars, regardless of size and shape, the "Automatic" action is identical . . . the rewards of which always are the same. Increased tonnage, greater turn-over of cars, fewer cars, faster, safer haulage—lower costs per ton of coal produced (savings so great they often pay for the cars in 12 to 18 months) and conservation of man power (so much needed now).

S-D 1-2-3 "Automatics" are recognized, more than ever before, by leading mining men, as essential equipment for maximum production at the lowest cost per ton. An investigation will convince the most skeptical "Doubting Thomas."

**You Can Have S-D 1-2-3
"Automatics" on a RENTAL PLAN**

You may have all the advantages of S-D "Automatics" on a rental basis, and your savings will more than pay the rentals. All the time, you will have an option to purchase the cars and terminate the rental contract. This proposition is proof of our claims of what these cars will do for you.

**SANFORD-DAY IRON WORKS
KNOXVILLE TENNESSEE**

Post-War Industrial Health

IN a two-day session, November 15-16, at Mellon Institute in Pittsburgh, about 500 people attending the meeting of the Industrial Hygiene Foundation of America were brought up to date on many activities which have a distinct bearing on post-war industrial health. The changes in this field have developed very rapidly in the last few years, with a large number of needs arising out of the impact of war.

The opening address of the meeting was given by Andrew Fletcher, vice president, St. Joseph Lead Company, who is also chairman of the Foundation's Board of Trustees. He spoke on "The Foundation in War and Post-war."

Mr. Fletcher looks forward with much enthusiasm to the post-war earning possibilities of our nation and to the position which we will hold in the world. He stated that he is confident that with an expanding program for private enterprise, industry will accept the responsibility of fair wages and the disposal of its products at reasonable prices. He also said that he was assuming that we, as individuals, and collectively as a nation, will destroy the myth that many of our people and the Government have a secret bank account that can be drawn upon to give us those things we want. "The sooner we realize that we obtain nothing in this world without paying for it the better." The Foundation's part in the post-war world will be in promoting greater consideration for the human machines in industry, Mr. Fletcher said, and added, "We should never consider only what the man or woman does with the machines and overlook what the machine does to the worker."



Andrew Fletcher

War Shortages Are Acute

The keynote address was given by Hiland G. Batcheller, vice chairman of operations of the War Production Board, and president, Allegheny Ludlum Steel Corporation, who said that the most critical shortages of the war are delaying victory in both Europe and the Pacific. Shortages of heavy trucks, shells, and mobile artillery have held back progress on the German front, while in the Pacific 14 per-

Theme of the Ninth Annual Meeting of the Industrial Hygiene Foundation of America Embraces Many Important Current and Future Problems

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cent of all our landing craft is idle at times for lack of spare parts. He noted that it is far better to save the G.I. Joe's life first and then consider making a job for him when he returns. Over 90,000 men and women are needed immediately to bring lax military programs up to schedule and an additional 100,000 will be needed to man new facilities coming into production. Mr. Batcheller stated that "One of the troubles is that everybody's mind is on reconversion" and "We can't seem to get across the fact that we have alarming military shortages. I believe we must have reconversion planning, but we must not let it interfere with war production. G.I. Joe wants a job when the war is over and that's all the people are talking about. I want him to have a job, too, but I'd rather have a live Joe waiting three months to get his job than to have him lying in a slit trench dead for lack of shelter, medicine, guns or ammunition."

Jobs for Returning Veterans

The remainder of the Wednesday morning session was devoted to a panel discussion on "Putting the Disabled Veteran Back to Work." This is a continuation of the panel discussion pioneered at the Foundation's 1943 meeting, presenting experience in successful job placement of discharged veterans; in other words, a 1944 progress report on actual cases in representative companies. Discussion was presided over by C. D. Selby, M.D., medical consultant, General Motors Corporation, and a member of the Foundation's Board of Trustees and Medical Committee. Dr. Streets reported that the Westinghouse Electric and Manufacturing Company in the past eight months has hired 822 discharged veterans. A vast majority of these men were discharged for medical reasons, he said, the largest number, 161, for psychoneurosis; the next largest number, 83, for war injuries and others for lesser disabilities. "He was pleased to report that most of the veterans have made an excellent adjustment and apparently are happy in their jobs. Dr. Krieger said that although most veterans hired

by Ford Motor Company were completely satisfied and satisfactory, some apparently are restless and need a "conditioning station" in between the services and industry. He briefly described the work being done at a camp operated by Ford to train discharged veterans, especially those with definite physical disabilities.

Medical and Engineering Problems

The medical and engineering session was presided over by Col. A. J. Lanza, M.D., director, Occupational Health Division, Army Service Forces, member, Foundation's Board of Trustees, and chairman, Medical Committee, and by Philip Drinker, Sc.D., Harvard School of Public Health; member, Foundation's Board of Trustees and chairman, Preventive Engineering Committee. A paper, "Recent Developments in Pre-placement Physical Examinations," was offered by C. M. Peterson, M.D., secretary, Council on Industrial Health, American Medical Association. Hallowell Davis, M.D., Associate Professor of Physiology, Harvard Medical School, presented a most interesting paper "Protection of Workers Against Noise." He spoke of the studies of injurious effect of noise and the methods of protection against them initiated for military reasons which will benefit peacetime industry as the results become available. He stated that "The first principle is to reduce production of noise. This may be practical in some situations with the problem of acoustics considered in advance. Recent models of street cars are an excellent example of this type of engineering. Substitution of welding for riveting is another."

"A second principle is to absorb the noise after it has been generated. This is the basis of the familiar acoustic treatment of offices and cafeterias" and "Unfortunately neither of these principles will eliminate all the high level noises from industry and we shall frequently be forced to fall back upon the third principle, the exclusion of noise from the ear. Dr. Davis then described the various methods which have been tried for the exclusion of noises in the form of ear plugs now available which attenuate noise

by 30 decibels or more, enough to bring extreme noises of present industrial situations down to the probably harmless level of 100 decibels. "Regardless of the possibility or rather the probability of long-term injurious effects of such high level noise on the riveters, noise may be sufficiently fatiguing, annoying and distressing to contribute to a high rate of absenteeism in spite of great motivation for patriotic as well as for financial reasons to continue on the job."

Are Many Psychoneurotic?

The public is taking too seriously the word "psychoneurotic" stamped on many veterans' discharge papers. Dr. L. E. Himler, assistant professor of mental health at the University of Michigan, stated that in many cases the word may simply mean that the man was unsuited for military service and added that it might actually boil down to inability to get along with a top sergeant. He declared that 30 percent of the men being discharged from service today bear the psychoneurosis stamp and noted that about half of these will adjust themselves to civilian life and employment without any special help. Only about one-tenth of them needs any real psychiatric care and in most cases that can be handled by a lay counselor with some insight into human behavior, such as the plant physician. Colonel Andrews, of National Selective Service, added: "Many misconceptions exist in this field and will result in a difficult reception at home, a cold shoulder from former acquaintances, a misunderstanding among employers. Even men in high government positions are reported as having stated that they do not want to employ a psychoneurotic."

"Such individuals need to be educated to the fact that the great majority of these men so discharged are not incapacitated. None are psychotic and very few are any less capable of holding jobs than they were before they went into the army."

Colonel Hatch, reporting on experiments conducted at the Armored Medical Research Laboratory at Fort Knox, Kentucky, showed that men can work fairly well in temperatures of 120 degrees if the humidity is not over 20 percent. If the humidity is 100 percent, however, men cannot work at more than 92½ degrees. Dry heat of 200 degrees can be tolerated for short periods if the person is inactive. In addition to humidity effect, the ability of a person to stand heat depends upon his age, physical conditions and acclimatization to the heat.

"Effectiveness of Tall Stacks in Minimizing Objectionable Emanations from Industrial Plants" was of special interest to mining men and was presented by George R. Hill, Ph.D.,

director, Department of Agricultural Research, American Smelting and Refining Company. He presented the results of 30 years of trial and experiment to prove the value of tall stacks diluting the sulphur dioxide vapors from metallurgical operations to such an extent that they were no harm to surrounding vegetation. MINING CONGRESS JOURNAL expects to report this paper in full in a forthcoming issue.

Legal Problems of Health

The Thursday morning session was devoted to reports of the legal section of the Foundation, presided over by Theodore C. Waters, of Mullikin, Stockbridge and Waters, a member of the Foundation's Board of Trustees and chairman, legal committee. This particular phase of the program dealt with medical and legal aspects of compensation for partial disability from silicosis, existing second injury fund and recommended legislative provisions, and legal developments in 1944 respecting industrial health.

Following the legal section, a session was held by the management section with R. A. Hohaus, associate actuary, Metropolitan Life Insurance Company, presiding. A frank panel consideration of the subject of sickness indemnification, popularly called health insurance, of increasing concern to management, was entered into. "The Economic Basis of Health" was discussed by Andrew Court, of the Labor Economics Section, General Motors Corporation, who defined the problem and outlined the requisites of sound health in terms of medical care in connection with sickness. A second paper in this panel "Sickness Indemnification" was presented by W. M. Gafafer, D.Sc., principal statistician, U. S. Public Health Service, who discussed the advantages and disadvantages of sickness indemnification plans based on studies of sick absenteeism and sick benefit plans in operation among Foundation member companies. This session continued into the afternoon with talks by Dr. N. Sinai, professor of public health, University of Michigan, who spoke on "Medical Expense Indemnification" and described the advantages and disadvantages of medical expense indemnification plans, including the results of case studies in the United States and Canada. In the open discussion which followed Dr. Sinai's paper, the fact was well brought out that the problem of sickness and health insurance is not a thing of the future but an urgent need of the immediate present. Dr. Sinai explained many of the difficulties attending the administration of health insurance. Citing hospital insurance as an example, he intimated that neither the expenses that must be borne by the patient himself or ethics of physicians have been able to eliminate excessive hospital use.

Absenteeism and Health

Dr. Gafafer, reviewing statistics, showed that the number of persons who were absent from jobs in industry because of illness of eight days or longer increased greatly in 1943 as compared with 1942. He quoted from figures prepared by the Hygiene Foundation and the Public Health Service. The Foundation figures, covering workers of eight large companies, showed that an average of 121.1 male workers out of every 1,000 lost eight days or more because of sickness in 1943, as compared with only 85.9 per 1,000 in 1942. The increase was 41 percent.

Among female workers, 145.5 per 1,000 lost eight days or more in 1943 against 90.6 in 1942, or an increase of 61 percent.

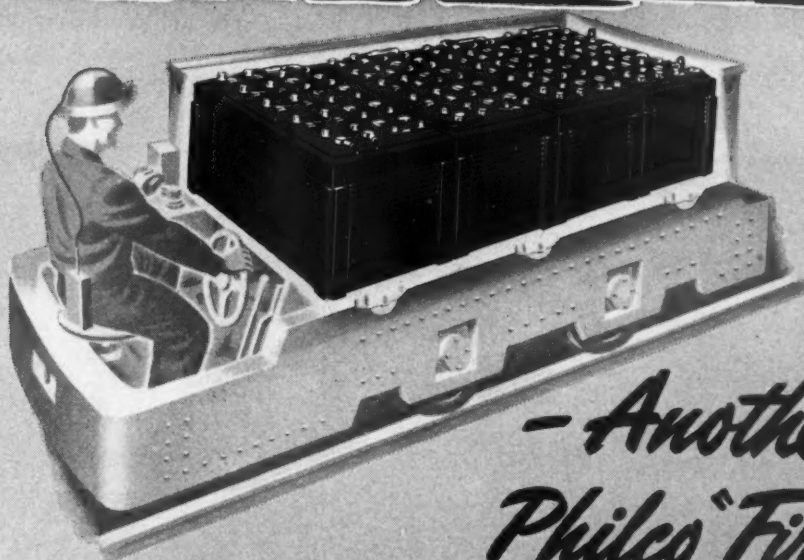
Andrew Court said that limited experience so far indicates that a health insurance plan providing complete coverage would more than double the use of medical care. It is doubtful, he said, whether this would result in any great betterment of health.

The final paper on the program "Increasing Importance of Industrial Health in Industrial Relations," was presented by V. P. Ahern, executive secretary, National Industrial Sand Association; industry member, National War Labor Board.

Mr. Ahern stated, "It is true that this question of industrial health has already gained the status of a major problem." He noted that there is hardly a major case which comes before the War Labor Board which does not involve, in some way or another, a demand that something shall be done to improve industrial health. The necessity of meeting such demands cannot be ignored by practical men in industry. He mentioned numerous cases which have come before the War Labor Board involving one or more phases of this problem.

Industry has a magnificent opportunity to show what can be done to give employment to workers who would at one time have been regarded as disabled and therefore not capable of qualifying for a job. We have found, for instance, that blind people can do work of a very skilled character even to the point of doing it better than people with normal vision. Other people have been found who were regarded as too crippled to permit doing heavy physical work; we have used them however, and they have made a magnificent contribution to war production. Adequate ventilation, illumination, toilet facilities and showers, proper protective clothing, protective equipment and properly handled in-plant eating were mentioned as among the industrial health problems of today which require effective solution.

PHILCO
Again in the News
**THE BATTERY
THAT GIVES
30% LONGER LIFE**



*- Another
Philco "First" -*

Revolutionary new
PHILCO "THIRTY"

**WITH 30% LONGER LIFE
RADICALLY CUTS
MINE BATTERY COST!**

- ★ ***Reduces depreciation and maintenance***
- ★ ***Gets more work done***
- ★ ***Packs a terrific wallop***

What every mine operator wants in a locomotive and shuttle car storage battery is **packed** into this amazing new Philco "Thirty."

In high capacity, it is **tops** in the field—assuring the maximum tonnage every shift. Even after long hours of heavy work, it has the reserve power to climb ramps and grades, and complete the shift in *high*.

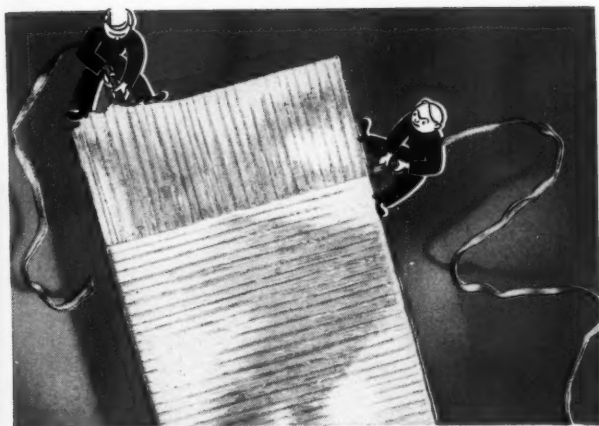
But the feature which sets the new Philco "Thirty"

entirely apart from all other batteries you have known, used, or even heard of before—is its phenomenal long life. **30% longer life**—often more—has been demonstrated time after time in exhaustive field tests.

Here, then, is more than just a new and better battery. Here is a new standard of battery performance—and a new yardstick by which all battery values must now be judged.

That's why it will pay you to get posted on this great new Philco Battery which is now available in certain types and limited quantities. Full information gladly will be sent on request.





REVOLUTIONARY NEW PRINCIPLE OF PHILCO FABRICATED INSULATION*

Only PHILCO "THIRTY" has it!

Here is a brand-new construction principle and an ultra-modern application of a proven insulating material. Both the results of Philco pioneering! This material is fabricated glass tape wrapped around the positive plates in two layers, first vertically and then horizontally. Even a single layer of this glass tape insulation has been found to have better retentive power in holding the active material in the plate, than the standard glass mat! And—of course, the plates of the Philco "Thirty" are further protected and insulated with the time tested Philco slotted rubber retainer and rubber separator.

*Patent applied for



← Note sediment



← Note absence of sediment

PROVED BY YEARS OF FIELD AND LABORATORY TESTS

As proved in scores of service tests, these unretouched photographs show what happens when a Philco "Thirty" cell (A) and a conventional type cell (B) are tested side by side in motive power cycle service, charged and discharged in series in the same circuit. Glass jars were used here only to permit observation. Note almost total absence of sediment in the Philco "Thirty", while the sediment space of cell B is filled. Cell B has delivered its normal life expectancy and is worn out—while the Philco "Thirty" still delivers over 100% of rated capacity, with a long margin of serviceable life still to go.

YOU GET
IT FIRST WITH
PHILCO

THE CLIMAX OF 50 YEARS OF LEADERSHIP IN BATTERY RESEARCH AND ENGINEERING

The procession of Philco "Firsts", covering the whole field of motive power and stationary batteries, has set the pace in modern battery design. Check the developments, which have contributed most to today's higher capacities, increased efficiency, longer life, and lower cost—the record shows you get it first with Philco.



PHILCO VITRABLOC

A development for telephone, control and standby service, that materially increases battery room capacities.



PHILCO FLOTÉ

The battery that exerted a major influence on the wider use of full float service, by eliminating low cells. More efficient... more economical to maintain.



PHILCO HIGH CAPACITY CELLS

Through modern plate design, Philco showed the way to increased capacity without increase in over-all battery dimensions. A tremendous advantage in many motive power operations.



PHILCO

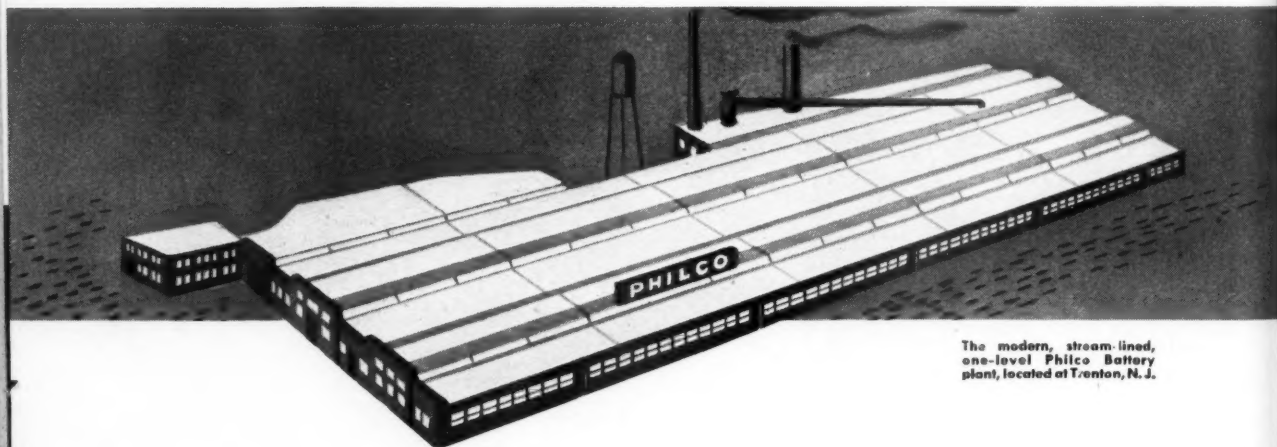
**BUILT FOR MODERN DEMANDS
BY THE LEADER IN
MODERN BATTERY ENGINEERING**

As described in the foregoing pages, Philco is ready, today, with the advanced battery performance and long-life economy you'll need in your post-war operations. With model manufacturing facilities, Philco is ready to produce these superior batteries in greater volume than ever before.

In the complete Philco line are modern

storage batteries for all industrial applications—industrial trucks, mine locomotives and shuttle cars, diesel starting, railroad car lighting and air conditioning, control and power, telephone service and signal systems.

On your next purchase of storage batteries specify a modern Philco.

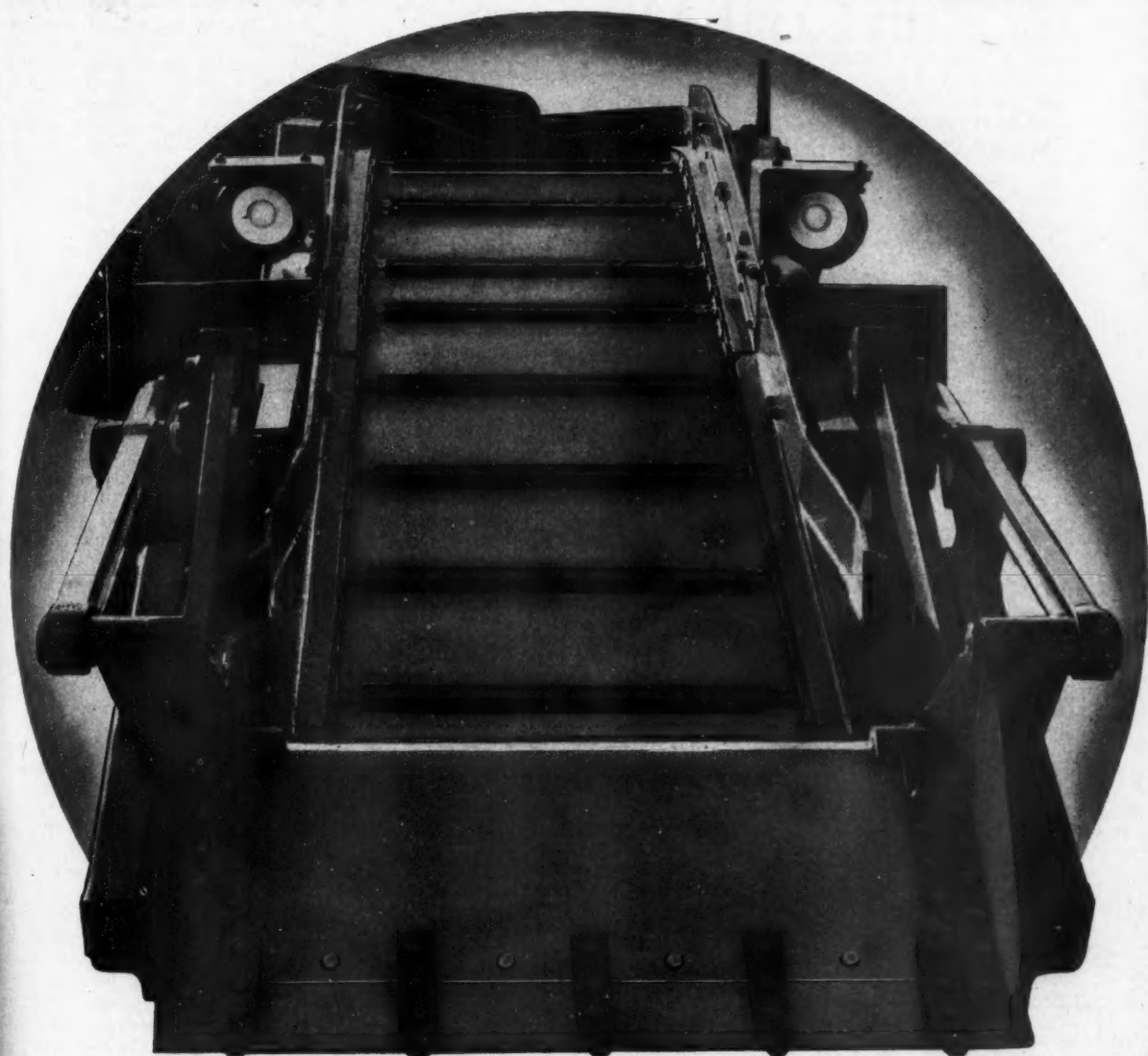


The modern, stream-lined, one-level Philco Battery plant, located at Trenton, N.J.

PHILCO CORPORATION
STORAGE BATTERY DIVISION • TRENTON 7, NEW JERSEY

For 50 Years a Leader in Industrial Storage Battery Development

• Get Ready, with the Whaley "AUTOMAT" for Post War Competition



Designed and built to stand up and deliver the goods under the most severe conditions!

• The Whaley "Automat," first and foremost, is a high capacity, low maintenance coal loader. In addition, it has proved to be an outstanding machine in the heavier duty of complete seam mining where coal and slate or rock are shot together and loaded in one operation. You don't have to baby a Whaley "Automat."

The basic reason for the Whaley "Automat's" ability to stand up and deliver the goods under severe condi-

tions is its smooth, automatic shovel action which is an exclusive feature of the Whaley "Automat." It is this smooth, easy, shoveling action that permits the Whaley "Automat," operated by only one 25 H.P. motor, to maintain an average loading rate of 3 tons per minute in coal, rock or any other loose material, with a maximum loading rate of 7 tons per minute.

Investigate the Whaley "Automat" and anticipate your loading machine

requirements for 1945 and 1946 now. Remember, you get an all-purpose machine when you get an "Automat." Myers-Whaley Company, Knoxville 6, Tennessee.

MYERS-WHALEY

*Mechanical Loaders
Exclusively
for Over 36 Years*

Safety and Efficiency in Coal Mining

Thirty-seventh Annual Meeting of the West Virginia Coal Mining Institute Brings Forth Much Valuable Data and Discussion

MEETING at the Daniel Boone Hotel in Charleston, November 24, for an all-day conference, members of the West Virginia Coal Mining Institute heard six important talks on current problems in the coal mining industry. D. L. McElroy, 1944 president of the Institute, opened the meeting and introduced Laurence E. Tierney as chairman of the morning session.

N. A. Elmslie, division superintendent, Industrial Collieries Co., spoke realistically on "Some Observations on the Safety Movement." His remarks were concerned with the all too prevalent custom of mine supervisors to rely on the "rule book" as far as safety goes. He stated that, "rules become crutches on which we lean" and noted that there is plenty of indication that we take the employees' obedience to the rules for granted. Pointedly, he referred to one mine which operates without a single safety rule or regulation and which has gone 35 years without a fatality. He opined that rules are fine for the regular day to day operations but that they fail when something unusual or unexpected comes along; and, that the more safety rules we have, the more attention supervisors must pay to educating the personnel to the fact that rules will not take care of the unexpected situation.

He then went on to show that mines which have the *best top* are often the most dangerous while mines which have *poor top* are equally often the safest, because of the attitude of the workmen toward recognized danger. He asserted his belief that the man most responsible for accidents in any company is its president and that it is the president's job to see that every man he employs has the natural instinct to fend off accidents. "A man has got to think," if accidents are really to be avoided.

Commenting on these down to earth observations of the mine safety problem, Charles Heaberlin, of the State Workmen's Compensation Commission, noted that safety is a matter of education, not something that can be

bought like a piece of machinery or other equipment—"by the pound or the yard." He noted, however, the effect of safety rules in the matter of compensation and called to mind that the aid given an injured man is directly affected by whether or not he violated an existing safety rule. The law calls for compensation and cases are adjudged on this basis. He asked for a better follow-up of safety rules instead of merely handing them to a man, getting his receipt for them, and then forgetting the matter.

J. O. Cree, of the West Virginia Engineering Company, offered considerable data on "A Comparison of Power Use for Hand Loading and Mechanical Loading." His general conclusions were:

The actual power use at the "face" is increased a very slight amount for mechanical loading when compared to hand loading of coal. However, for mines where approximately the same tonnage per month has been produced by both methods, the total power use for mechanical loading has increased about 100 percent. This increase in total power use is due to several factors, which are:

First. The substation capacity for mechanical mining has about doubled, which would require greater conversion losses.

Second. The d-c power transmission losses have greatly increased.

Third. Coal preparation in the tipple, and in most cases addition of a cleaning plant have been factors in the total power increase.

During the morning business session, the Institute's Student Award for 1944 was announced. It was won by William H. Noone, Jr., of Longacre, W. Va., a student at the School

of Mines, West Virginia University. "What is Ahead for Business and Industry in Light of the November Elections" was ably discussed by Ralph C. Mulligan, of the National Coal Association, at the noon luncheon. He held little hope for improvement in the matter of government controls and pointed to the huge hydro-electric programs now being proposed and projected through which the Federal Government will contribute heavily to cutting down one of coal's best markets. He noted President Roosevelt's strengthened control over Congress and predicted that "few new faces" would be seen in the administration.

The afternoon session, presided over by Joseph Pursglove, Jr., began with "What the Coal Industry Can and Should Do in the Way of Personnel Relations," by J. J. Foster, assistant to the vice president, Island Creek Coal Co. Viewing the fact that current conditions have developed an extremely temperamental and

hard to please employee, he discussed some of the problems thus given rise to. Some of these are industry-wide, others are his only individual companies.

He especially pointed to the need for selling employees on the idea that coal mining is as good as (or better than) any other employment. The vocational school movement in West Virginia was given high praise for the important role it is playing in this matter (MINING CONGRESS JOURNAL, November, 1944). Leadership as well as skill must be developed and the whole employment procedure must bear this and other important features in mind in the future. Most of the training of mining men must be done in and around mines. He gave full praise to the "Training Within Industry" program.

Foster noted the problems that industry faces in placing those returning war veterans whose nervous afflictions make them special cases and cited several difficulties already met by his organization. Sharp noise, feeling of inferiority, imagined oppression, all are to be expected to give trouble. Among all employees, grievances (real or imaginary) must not go uncared for. If the employee imagines he has a grievance—then it one, and it demands attention.

The need for better housing, recreational facilities and general upgrading of his existence means much



D. L. McElroy



Laurence E. Tierney

the present-day employe and will mean even more in the future. He wants these things for himself and family and above all he wants "recognition"—a strong and secure place in society with a job which shows dignity and prestige.

As a comment on Mr. Foster's well-founded words, S. R. Pursglove pointed to the important fact that there are some in any "average" group of people who simply cannot be expected to work in a normal manner. Misfits of all kinds entering the picture are to be expected, and these can only be cared for through individual attention suited to their peculiar frailties. He noted the statement revealed by medical authorities that at least 1 in 20 of us will spend some time in a mental institution.

Other comments indicated a need for "G.I. rights" for the returning veteran who had no job before entering service and for an even more intense search for prospective supervisory "material."

Carel Robinson, senior member of Robinson & Robinson, consulting mining engineers, Charleston, made a number of timely comments and gave encouraging forecasts for "Mechanization in Thin Coal." He recalled that thin seam mines which were forced to stop during the depression, later came back with the help of mechanical improvements to do better than the hand-worked thick seam mines. With mechanization of "thick seams," of course, the "thin seams" have had to step up again.

Of paramount importance is the increase of head-room in haulageways and ventilation ways. Increased head-room makes heavier hauling equipment available with consequently reduced costs. When driving headings, no difference in cost per ton of coal obtained is noted whether the coal alone is taken out in a low heading or the coal is first loaded and then the top blasted and loaded, before the loader is moved away.

Among important improvements, he noted the Goodman bug-duster screw which carries the dust to a point under the dust pile and thus reduces dust hazard. The device also produces less fines by avoiding recirculation of dust. He called for: improved cutter and drill bits (design and materials) to reduce bit changes; better facilities for adjusting cutter-bars, instead of jacking; lighter alloys for conveyor pans; rubber-tired supply cars to bring supplies direct to face; better illumination instead of belt and lamp (possibly indirect lighting); fog nozzle improvement to avoid clogging and permit utilization of any nearby water supply. The advantages of 3-drum hoists in heavy shifting problems and the mechanization of duckbills for the drawing across the face were named as important advances. With only 25



NEW OFFICERS

West Virginia Coal Mining Institute

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Laurence E. Tierney, Jr., Bluefield
President, Eastern Coal Corp.

Secretary-Treasurer

G. R. Spindler, Morgantown (Charles
T. Holland, Acting)

Asst. Director, Mining Extension, W. Va.
University

Vice President

Joseph Pursglove, Jr., Morgantown
Pursglove Coal Mining Co.

J. J. Foster, Holden

Asst. to Vice President, Island Creek Coal Co.

R. H. Morris, Ansted

Gen. Mgr., Gauley Mountain Coal Co.

Jesse Redyard, Charleston

Chief, State Department of Mines

George R. Higginbotham, Fairmont

Asst. to Vice Pres., Consolidation
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Company

D. L. McElroy, Fairmont

Chief Engineer, Consolidation Coal Co.



percent of the coal mining cost actually affected by thinness of seam it is now possible for many thin seam mines to compete with those in thick seams.

Comments by E. H. Johnson, mining engineer, the Jeffrey Mfg. Co., indicated the increasing importance of thin seam mining in many sections with the mining out of much thick seam coal. He also called attention to the important fact that adequate travelways are desirable because of egress in case of accidents.

John C. Clarkson, of the Clarkson Mfg. Co., pointed to his frequent observations on the safety improvements

possible through remote control—the operator is out where he can see *everything* the machine is doing. He also stated that suggestions from the miners themselves are of paramount importance in improving mining operations.

Mr. Farr, of the Goodman Mfg. Co., brought out the fact that the returning veteran will have a mechanical complex brought out by his experiences and will want to come back to mechanized mines. He said that we all want and are trying for an uninterrupted flow of coal from face to railroad car and that many more developments will transpire to make this possible. He recommended a device to put refuse in the gob instead of taking it out of the mine.

The Joy Manufacturing Company's representative commended and approved Mr. Robinson's remarks as well as those of the other speakers.

Edward R. Burke, president of the Southern Coal Producers Association, spoke following the evening banquet on "The Coal Operator and His Government." He declared that the uncertainties of taxation and labor relations were retarding the flow of capital into private investments and that, "it is clear that high taxes will be with us for a long time to come. . . . It is time for business and industry to prepare for what may well be a life and death struggle. . . . The demands upon the Federal Government at best will continue to be so great," Mr. Burke said, "and the carrying charge of accumulated deficits so high, that a substantial portion of every dollar of wealth that is created must be turned over to the Federal Government to pay the bills."

"Greater benefits will come to more people if we have a tax program that encourages, rather than stifles, the full investment of private capital in productive enterprise."

PETER F. LOFTUS

Consulting Engineers

ENGINEERING AND ECONOMIC SURVEYS, ANALYSES AND REPORTS ON POWER APPLICATIONS AND POWER COST PROBLEMS OF THE COAL MINING INDUSTRY

Oliver Building Pittsburgh, Pa.

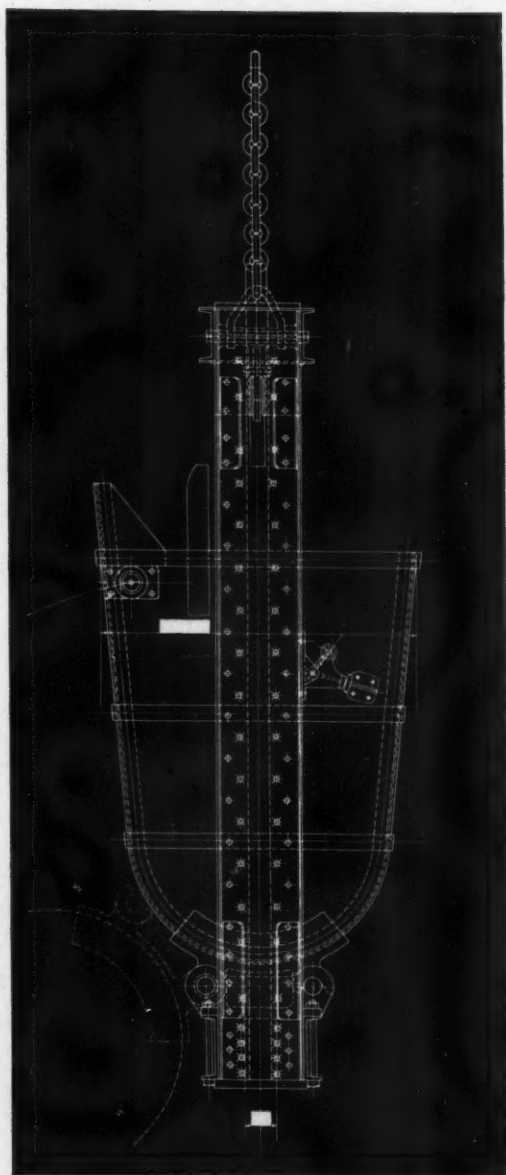
L. E. YOUNG

Consulting Engineer

Mine Mechanization
Mine Management

Oliver Building Pittsburgh, Pa.

SKIPS that whip PRODUCTION PROBLEMS

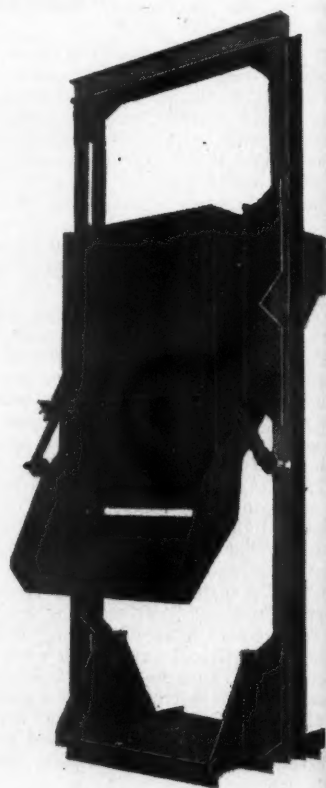


● Holmes Skips are durably constructed of steel plates riveted and heavily reinforced. They are, however, so designed as to eliminate all excess weight and built to close tolerances for smooth and rapid operation.

● Rapid replacement of worn parts is one of the first considerations in the fabrication of Holmes mining equipment. Built always to give the utmost in dependability and length of life.

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DESIGNERS AND
FABRICATORS OF
MINING
EQUIPMENT FOR
OVER 70 YEARS.

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THE SERVICES OF
OUR ENGINEERS
ARE AT YOUR DISPOSAL



ROBERT HOLMES AND BROS., Inc.
DANVILLE, ILLINOIS

The Jenny Is A "Husky" That Gets Things Done!



Simplex Jenny Center-Hole Hydraulic Puller. Five models; capacities 30 to 100-tons.

No matter how tough the pulling, pushing or lifting job, the Simplex Jenny gets it done in minutes instead of hours. "Impossible" maintenance tasks around mines are all in the day's work for this powerful hydraulic unit, which is ruggedly built of heat-treated alloy steels. The Center-Hole makes the Jenny a great manpower saver when pulling bushings, cylinder liners, pistons, wrist pins, valve seats, keys, wheels, sprockets, gears, etc. Alloy rod can be tack-welded to parts to be pulled, passed through center-hole in Jenny and bolted or fastened above the ram. Can be readily set up as a portable press. Send for Bulletin No. 43-J.

Simplex LEVER - SCREW - HYDRAULIC **Jacks**

Templeton, Kenly & Co., Chicago (44), Ill.
Better, Safer Jacks Since 1899

PARMANCO Horizontal Drills

PARMANCO Horizontal Drills are used exclusively in the Iron Range for horizontal drilling.

They are also used by a large percentage of the strip coal mines. The new PARMANCO Vertical Drill has revolutionized test drilling. Write us your drilling problems.



PARIS MANUFACTURING CO.
PARIS, ILLINOIS



THE PROFIT IS IN THE



THE straighter the rib, the greater the percentage of lump—and profit—for you. To see the Sullivan 7-AU in action is to learn how it can increase production and lower the cutting costs in your mine.

Watch this powerful machine make parallel rib shears more than 21 feet apart, resulting in a straighter rib and more lump. See how the cutter bar swings swiftly and surely into position to make a horizontal cut, up to 41 feet wide anywhere from 10 inches below rail to 102 inches above rail. Notice how the 7-AU can make two cuts from one laying of track or cut or shear a room neck without requiring turnout switches.

Then, when you learn that the Sullivan 7-AU is simply designed—only 20 gears and 6 hydraulic valve-levers—you'll know why it can increase production—and profit—in your mine.

SULLIVAN MACHINERY COMPANY,
Executive Offices: Michigan City, Indiana. In Canada: Canadian Sullivan Machinery Co., Ltd., Dundas, Ontario.

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Coal Mining Machines • Scraper Haulers • Rock Loaders • Hoists •
Car Pullers • Air Compressors • Coal Drills • Rock Drills • Cutter
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SULLIVAN 7-AU IS LICENSED UNDER PATENTS TO E. C. MORGAN,
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MODERN MACHINES FOR



EVERY MINING METHOD

NEWS *and* VIEWS

Victor Pegorie, Smithtown, Pa., motorman for Pittsburgh Coal Co., hasn't taken a day off since January 1, 1900. He has never been sick or had a lost-time accident—and estimates he has hauled over 1,000,000 tons of coal, enough to make steel for 16,000,000 5" shells!



—HAMILTON-WRIGHT PHOTO.

Eastern



States

WEST VIRGINIA

» » » West Virginia maintained its national rank of fourth in total value of minerals produced in 1943 and took top rank in total value of bituminous coal produced, according to official reports. Total mineral production value was \$560,330,000 with coal valued at \$450,128,000. Pennsylvania mined \$396,410,000 worth of bituminous coal and Kentucky \$160,829,000 to occupy second and third places.

Texas, Pennsylvania and California finished in the lead because of heavy petroleum production. West Virginia's contribution of total U. S. mineral products mined was 8.52 percent. Natural gas produced was valued at \$80,930,000—also fourth rank in the country.

From 1911 to 1943 inclusive, the state produced \$9,728,600,000 in mineral values.

PENNSYLVANIA

» » » The Consolidation Coal Company has announced the opening of an office in the Koppers Building in Pittsburgh.

» » » Plans are being made for the construction of two briquetting plants by the Philadelphia and Reading Coal and Iron Company, to be located respectively at their St. Nicholas and Locust Summit Breakers. They will afford an outlet for small

sizes of anthracite now difficult to sell. Federal financing agencies will participate in the construction costs.

» » » The Ashley, Pa., Borough Council adopted a resolution calling for the establishment of a Mine Cave Commission to deal with a recent subsidence under a certain section of the borough, and to consider a program of prevention.

Councilmen of the borough will consider a list of names from which they will select the members of the committee. Alvin Funke, chairman of the citizen committee said, after a meeting with the Council, that the Councilmen expressed a desire to cooperate with citizens of the town in their efforts to deal with mine subsidence problems.

» » » Around 20,000 jobs are open in the nine-county Scranton area, according to the War Manpower Commission. Of these, 14,500 are in essential industries. The Commission estimates that 9,500 of the openings are in the coal mines. The demand for mine workers is acute in the northern anthracite area, while in the southern field the situation is not so serious. Under these conditions, it has been possible to transfer workers from the southern to the northern area of the anthracite region.

» » » The Shenandoah, Pa., School Board asked the Borough Council to assist it in its efforts to stop coal mining in the Kehley Run Colliery.

This action followed a report that the northeastern section of the town was threatened again by a mine cave. T. M. Brennan, Shamokin, Pa., consulting engineer, said an inspection of the area indicated a possible new subsidence. During 1940 a mine cave damaged a school and several buildings to the extent of several hundred thousand dollars.

» » » A decree dismissing the injunction asked by State Mine Inspector Harvey Hilbert against five bootleg miners at Branchdale was entered. The injunction alleged that the bootleg mining was endangering property and the lives of miners employed by the Branchdale Coal Company. The decree states that the allegations in the bill were not sustained by the evidence produced during the hearing.

» » » On November 4, 1944, the anthracite production for the calendar year to that date showed an increase of 6.5 percent over a similar period of 1943. Significant also is the increase of 5.5 percent in the production of domestic sizes, pea and larger.

» » » Of interest to anthracite coal mining men is a publication from the War Manpower Commission entitled "Manual of Manpower Utilization Case Histories." The section on the anthracite industry shows how

P. R. PAULICK

Consulting Mechanization Engineer

Specializing Exclusively in Practical Engineering Application of Fundamental Mine Mechanization Principles: Selection of Proper Equipment; Correct Engineering Planning; Proper Installation; and Efficient Operation.

South Park Road, Library, Pa.

labor-saving devices and changes in operation and policies have affected favorably both employment and production. An improved use of tools, the use of new devices, and revisions in operating methods are shown to have effected a total saving of around 688 men in the 37 anthracite case histories reported in the manual.

» » » A group of about 600 anthracite operators and engineers were guests of the Bucyrus-Erie Company at the Beechwood stripping near Minersville, Pa., where they witnessed the operation of the largest dragline shovel now in the anthracite coal mining area. The shovel is the walking type, electrically driven, weighs 1,200 tons, and is equipped with a 25-yd. bucket and a boom 180 ft. long.

The stripping project is under contract with the Corrae Construction Company, Hazleton, Pa., the owner and operator of the shovel. A virgin mammoth bed of coal over 100 ft. thick, on the property of the Philadelphia and Reading Coal and Iron Company, will be stripped. The coal thus recovered will be transported on a belt conveyor to the Oak Hill breaker of the coal company.

» » » The largest anthracite consumer is the Pennsylvania Power and Light Company, which burns a carload of anthracite every two hours. This statement was made by H. C. Freck at a meeting of the Pottsville Rotary Club. Since some of the power company's generating stations are located in the anthracite areas, many anthracite coal mines purchase power from it.

» » » The Blaw Knox Company, Pittsburgh, makes this statement concerning a packaged fuel plant in Philadelphia: "The new packaged fuel, which is not to be confused with briquettes sold in bulk, will be made from 80 percent anthracite and 20 percent bituminous fines held together by an asphalt binder. It will be made in the form of 3 by 3 by 3-in. cubes, each weighing a little more than a pound. A paper wrapped package will weigh 7½ lb.

The plant, for which a site is now being selected, is sponsored by the War Production Board and endorsed by the Solid Fuels Administration. It will be financed by the Defense Plant Corporation and will be built and operated by the Blaw Knox Company. An annual output of 150,000 tons is forecast, of which 120,000 tons will be anthracite.

A period of five months will be required to build the plant at a cost of approximately \$400,000, and it will be operated by Blaw Knox for the present.

While consideration is being given to the method of distributing the new

fuel, it will, no doubt, reach the consumer through regular retail outlets, grocery stores and filling stations.

New Research Service

The beginning of a department to provide special post-war engineering, combustion and research service to industrial, utility and domestic customers of the Koppers coal division of Eastern Gas and Fuel Associates is announced by Walter Rothenhoefer, general manager of sales.

Graham Granger, of Koppers Coal, has been assigned to head the new department. Mr. Granger is a graduate of Georgia School of Technology with a degree in engineering and, for nearly 10 years, was assistant to the general manager and combustion engineer for the Hershey Corporation before joining Koppers Coal in 1937. For more than a year since the beginning of World War II he was on leave of absence with the United States Army Ordnance Department.

Mr. Granger will head an organization of combustion engineers and service men who will be assigned to Koppers Coal's district offices.

His department will have the benefit of Koppers research at the Mellon Institute of Industrial Research as well as at Koppers' own laboratories, in-

WANTED — Coal laboratory technician. Permanent position for man experienced in complete coal analysis. Splendid opportunities. In applying, give education and experience. Address Box "A" care of this publication, 309 Munsey Bldg., Washington 4, D. C.

cluding their Stoker Research Laboratory.


While the creation of the department is now under way its completion is not expected until postwar manpower conditions make it possible to complete the staff.

MARYLAND

» » » Night mining classes have been established at the following times and places:

Monday night	Crellin
Tuesday night	Lonaconing
Wednesday night	Frostburg
Thursday night	Kempton
Friday night	Vindex

On October 1, 1944, the Maryland Bureau of Mines completed 22 years of service. There are five employees, three of whom have had 22 years and one 21 years' of service with the Bureau.




RAISE PRODUCTION PEAKS

Type KSC Sectionalizing
Circuit Breakers help
production by providing
much better continuity
in the operation of min-
ing, loading and haulage
equipment. Fire hazards
are reduced; mainte-
nance is lessened; total
energy consumption and
power demand are low-
ered.

Type KSC Sectionalizing
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Representatives in Principal Mining Areas



CIRCUIT BREAKER CO.

PHILADELPHIA 10, PA.



How We Harnessed a Magnet to Eliminate Wear

Where there is no mechanical contact between moving parts, no wear can take place. This is the principle which P&H uses to transmit power for hoisting the dipper of the new P&H Electric Shovel. . . . The *Magnetorque Drive* transmits torque by electro-magnetic forces rather than by mechanical contact. Designed specifically for Electric Shovel operation, it eliminates motor commutation problems, sliding gears, mechanical clutches and other complicated mechanisms. Reversing the hoist motor is no longer necessary. Hoisting is completely independent of all other operations.

The *Magnetorque Drive* is typical of the advanced engineering and simplicity embodied in every detail of the new P&H Electric Shovel. Write for full information about the new P&H Electric Shovels.



THE GREATEST FORWARD STEP EVER MADE IN ELECTRIC SHOVEL DEVELOPMENT



Left to right: Primary crushing, secondary crushing; west mill; sintering plant at Clifton mines, DeGrasse, N. Y.

ALABAMA

» » » The production of coal in Alabama mines during the first three quarters of 1944, showed a gain of more than 10 percent over the same period of 1943, according to the report of the State Department of Mines and Quarries. Fatal accidents were cut more than 50 percent of last year's record.

» » » Absenteeism is still the No. 1 problem in Alabama coal fields, says James A. Downey, Jr., War Manpower Commission Director for the Birmingham district. Absenteeism averages about 20 percent during the work month, according to reports to Alabama Mining Institute, and about 50 percent of this is recorded on Saturdays.

» » » Iron ore production for the first nine months of this year has run slightly under that of 1943. However, there has been enough to meet the furnace demands and no serious shortage has been reported. The percent of fatalities in this branch of mining has been very small.

Coal Mining Section

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1944—1945

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Central



States

TRI-STATE

» » » It is reported that J. V. Reynolds of St. Louis has purchased the Navy Bean mill of the Eagle-Picher Mining and Smelting Company. The mill is located three miles west of Wentworth. P. E. Tabor of Joplin is also interested in the transaction. Lease has been taken on 800 acres of mining tracts designated as the Owen land for mining development. It is planned to sink shafts and operate the mill as a custom mill.

» » » M. H. Van Ornum of the McAlester office of the U. S. Bureau of Mines recently completed two 15-hour courses in first-aid training in the Tri-State mining field. One course was given in the offices of the Tri-State Zinc and Lead Ore Producers Association for 15 employees of the United Zinc Smelting Corporation. Another course was conducted for 25 employees of the St. Louis Smelting and Refining Company at the Baxter Springs Golf clubhouse. Van Ornum will also offer 15 additional hours of training for a selected number of those who have completed the courses in order that they may qualify as instructors. Arrangements are also being made with other companies operating in the field for employees to receive the courses and perhaps later to stage a contest among teams from the various companies.

OHIO

» » » A test demonstration of more than a dozen new post-war industrial uses for the "Jeep"—from operating plant power tools to bulldozers—was given directors of Willys-Overland Motors at the company's plant at Toledo recently by Charles E. Sorensen, president.

Most of the activities were handled by Jeeps which have been on test 24 hours daily for the past two years. Others, however, were performed by a Jeep equipped with a power take-off and especially adapted for industrial and agricultural uses.

The demonstration was the second in a series of "previews" being conducted for directors of the auto concern to illustrate the post-war possibilities of the Jeep. Recently, the farm uses for the vehicle were displayed at Mr. Sorensen's farm near Detroit.

Although the showing was private, it was revealed that the new version of the Jeep provided power for such diversified tasks as spray painting, welding and sawing lumber, and also operated air-compressor equipment for chipping and riveting hammers, paving breakers, grinders, clay diggers, rock drills, wood borers and other industrial tools.

Numerous other uses for the Jeep as a versatile and mobile factory power plant were demonstrated. Equipment used was loaned by several specialty manufacturers.

Among other factory tests demonstrated were light delivery work, hauling of loaded "dolly boxes" and trailers, and the towing of a 14,280-pound trailer unit. The latter job, which requires 63 hp., was handled by Jeeps with the smoothness of a diesel locomotive.

The company's bright-red fire Jeep, which mounts a 500-gal. per minute

pump operating off the engine, fought a "mock" plant fire with columns of water, pumped from a nearby stream, climbing six stories in the air.

INDIANA

» » » The name of Ayrshire Patoka Collieries Corporation has been changed to Ayrshire Collieries Corporation.

International Mining Day

ABOUT 450 members of the mining fraternity registered for International Mining Day in El Paso on November 10 and 11. The visitors came mainly from Colorado, New Mexico, Arizona, Texas and Mexico, with representation from the West Coast, the Mid-West and the East.

International Mining Day was sponsored by the Mining Committee of the Chamber of Commerce in a move to develop El Paso as the mining capital of the International Southwest. Registration opened on November 9 and continued through the next day. Each registrant received a badge and an envelope containing the program and tickets to all events on the entertainment program. The principal

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Long Range Machines



EXPLANATION OF PICTURE—At an iron mine in the Adirondacks, tailings are crushed and screened and then the several sizes are stored in separate piles by three 1½ cu. yd. Sauerman Crescent Scrapers. The same scrapers reclaim the material as required to hoppers that feed to cars and trucks. Several hundred thousand tons are shipped yearly for use as highway aggregate and railway ballast. Picture shows scraper reclaiming.

CUT COSTS OF HANDLING MATERIALS

Large savings in man-hours are brought about by using Sauerman Drag Scrapers and Slackline Cableways in strip mining, tramming ore, placer mining, stockpiling and other material-handling jobs where the long operating range of these machines can be employed to advantage.

With one man at the controls, and with a small expenditure of power, a Sauerman machine will dig, haul and automatically dump a large hourly tonnage of any bulk material. Moreover, the cost of the equipment is moderate and upkeep is simple.

GET THIS USEFUL BOOKLET—Examples of pit and bank mining, stockpiling and reclaiming, moving loose rock and ore, etc., are pictured and explained in the Sauerman catalog. A copy of this book is yours for the asking.

SAUERMAN BROS., Inc., 540 S. Clinton St., CHICAGO 7

"hitch" in the convention was the difficulty in convincing the visitors that they were the guests and that only the El Paso mining men, who were their hosts, were to pay the usual registration fee.

There was only one business session which was held November 10. The principal event on the entertainment program was held November 11 when Lt. Gen. Brehon B. Somervell, Chief of Supplies, of Washington, spoke at a chuck-wagon supper.

The principal speakers at the business session were Philip D. Wilson, of Washington, vice chairman for metals and minerals of the War Production Board; Oscar H. Johnson, of Denver, representing the president of the American Institute of Mining and Metallurgical Engineers; John M. Kelly, director of the New Mexico Bureau of Mines; C. H. Dunning, director of the Arizona Department of Mineral Resources, and Walterio Sein, representing Governor Fernando Foglio Miramontes of Chihuahua.

Addresses of welcome were delivered by Mayor J. E. Anderson of El Paso and George G. Matkin, president of the El Paso Chamber. Robert D. Bradford, International Mining Day chairman, opened the meeting, and E. M. Thomas, dean of engineering of the Texas College of Mines, chairman of the program committee, introduced the speakers.

Mr. Wilson, in discussing problems of minerals and metals in war and reconversion, suggested that more metals be imported to save the nation's natural resources. He continued:

"To profit fully by a post-war era of full production and prosperity, it seems inevitable that the country must resort to imports of metals to an extent that has never been necessary before. We are going to finish this war with depleted natural resources. A democracy to survive must provide an insurance policy against the future. It has been suggested that we should exchange with other countries by importing raw materials and exporting the finished product to some degree, we could conserve on raw materials against future needs."

Mr. Johnson, speaking on the impact of war on mining, expressed an optimistic viewpoint for the future of the industry in the reconversion period. He said:

"There will be no sharp post-war boom or no sudden collapse in the mining industry."

C. H. Dunning, Director, Arizona Department of Mineral Resources, stated: "Mineral resources are conserved by production and destroyed by lack of production. Production will be an incentive to improve, develop and discover. If we keep moving, industry will be in a healthier condition."

In the question and answer period that followed the speeches, Robert

C. Stryker, WPB regional Director of Dallas, predicted that the conversion of mining from a war to a peace-time industry would be softened by the reconstruction program. He added:

"Mining, like other industries, can expect as much as a 40 percent cut-back when the war ends."

The mining fraternity seemed to be unanimous in predicting that the plastics industries would not affect mining. They agreed that plastics would have a place in our future world, but would never replace raw materials.

General Somervell, in paying tribute to the "hard rock" miner for his role in the war, supplied figures on mineral production from the International Southwest. The bulk of the copper, zinc and lead came from the International Southwest, he said. His tribute coincided with the International Mining Day theme as the El Paso Chamber had contended that honors had been heaped on other industries while the "hard rock" miner had been somewhat neglected. With General Somervell on the platform was Major Gen. Richard Donovan, Eighth Service Command Chief. Congressman R. E. Thomason presided.

An elaborate entertainment program was carried out for the visitors. It opened with a breakfast which was staged by the El Paso Rancheros, who appeared in Western costume. Following the business meeting, the

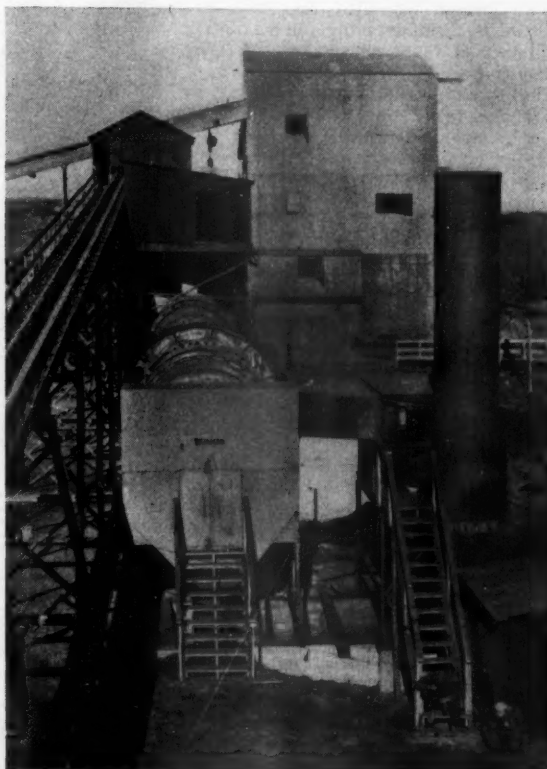
mining supply houses gave a cocktail party and buffet dinner. In the evening the visitors attended the "Nugget Fiesta," International Mining Day pageant, which traced the history of the Southwest from Indian days to the present. This pageant was sponsored by the Special Events Committee of the Chamber of Commerce, headed by Jack Stuart.

On the following day the visitors toured the Texas College of Mines, the El Paso Smelting Works, the Phelps-Dodge Refinery and the mining supply houses. At noon, they were luncheon guests of the Juarez Chamber of Commerce, on the other side of the Rio Grande. They then inspected the Chihuahua State mineral exhibit, which was moved from Chihuahua City to Juarez for this occasion. Later they visited Biggs Field as guests of the Army Air Forces. Following the chuck-wagon supper, the visitors attended a Sour-Dough dance, which was staged by the El Paso Junior Chamber of Commerce.

The Women's Department of the El Paso Chamber gave a coffee party for the wives of the visiting mining men and also conducted them on a tour of Juarez.

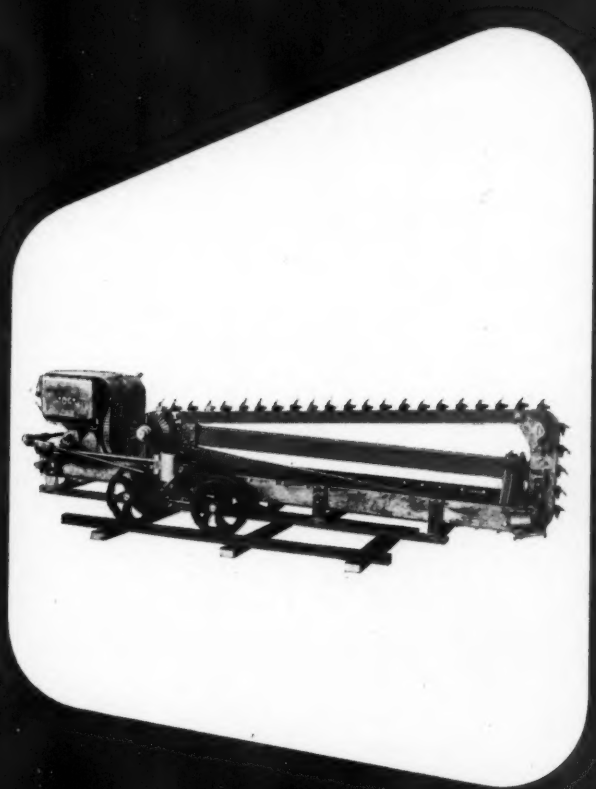
On November 9, as a separate event but held in conjunction with International Mining Day, the El Paso Metals Section of the A. I. M. E.,

Recently constructed iron-ore drying plant at the Philbin Mining Co. operation at Hibbing, Minnesota. It handles ore from the Weggum mine, a joint operation of Inland Steel Co. and Butler Brothers. It is managed by Butler Bros. and is the only drying plant now in operation on the Mesabi Range.



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DECEMBER

held a special meeting which was attended by the visitors. At this meeting, James P. Margeson, Jr., vice president of the International Minerals and Chemical Corporation of Chicago, which operates a potash plant in Carlsbad, N. Mex., discussed "Potash for War Production."

Five Millionths of An Inch!

Run your hand through your hair. Did you get a loose one? Gray, black, brown, red or blonde, it doesn't matter much.

Now if you could split that hair endwise into 30 slices, just as you would saw a big log into boards, then each slice of hair would be about one ten-thousandth of an inch thick.

Well, you might ask, who except the makers of fine watches and aircraft instruments are concerned with such fine measurements? America's ball and roller bearing industry is. In fact, the ball and roller bearing industry doesn't consider the human hair very fine. It's a bit thick for their purposes.

In the manufacture of anti-friction bearings, if the groove (technically known as the race) in the inner or outer rings, or the outside diameter of such rings, or the size of a ball or roller is off perfection by so much as the thickness of a hair, the man making it may start tearing out his own hair in despair.

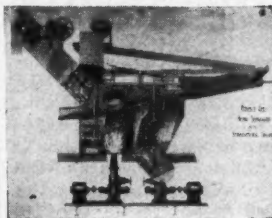
For each piece must be perfect to within one or two thirtieths of a hair's thickness. Bearings often revolve at almost incredible speeds, are built to run without attention for years, and there must be no wobble and no wear.

Some bearings have balls and rollers that are held to five-millionths of an inch tolerances . . . six decimal places!

In a Flying Fortress traveling around 300 miles an hour at 20,000 feet, the bombardier would miss his target by several hundred yards if any of the six 3/32-of-an-inch steel balls in the bombsight's tilting-control bearings should vary in smoothness more than one one-millionth of an inch. Yet this is only one illustration of the incredible tolerances to which U. S. equipment for war and peace must conform.



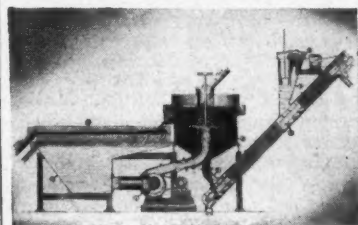
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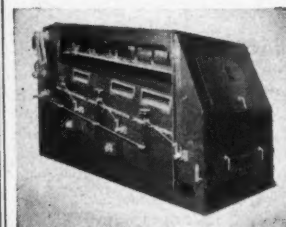
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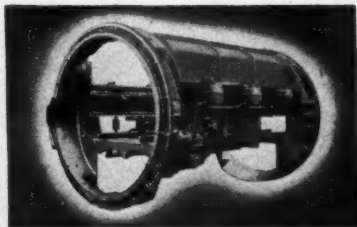
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WYOMING

» » » The annual report of the State Inspector of Coal Mines of Wyoming for the year ending December 31, 1943, shows increased production and a large reduction in fatal accidents as compared to 1942. Fifteen counties produced 9,237,728 tons of coal from 69 mines—an increase of 13 percent. Three thousand six hundred forty-eight men were employed inside and 1,027 outside for a total of 4,675. By far the greater tonnage was machine undercut with only 269,886 tons mined by hand and 317,851 tons strip-mined.

The mines operated an average number of 239 days with an average of 271.6 days for the railroad mines. Thirteen fatal accidents occurred with 710,594.51 tons of coal per fatality, or a rate of 2.78 fatalities per 1,000 employees.

Figures reported also show an overall average of 3.73 tons of coal produced per pound of explosive.

UTAH

» » » An organization known as Metal Producers of Los Angeles, Calif., has begun rejuvenation of the old Horn Silver mine located in the San Francisco mining district, Beaver County, Utah. A complete surface plant has been installed at the surface of the King David shaft. The shaft has been reopened and re timbered to the 800-ft. level and a crosscut started toward the old mine workings which have been abandoned due to caving. The King David shaft and crosscut will give an entirely new entrance to the Horn Silver ore channel which has a production record dating back 50 years. Prior to the cave, a sizable tonnage of complex silver-lead-zinc sulphide ore had been blocked out. Work at the property is in charge of A. E. Kipps, engineer.

» » » The United States Bureau of Mines has resumed development work at the Alta United Mines Company property, located in the Alta mining region, Utah. Since the resumption of work two months ago, three shipments of ore have been made. The ore carries high values in silver, bismuth and a small amount of copper. The Bureau of Mines is seeking primarily to explore the bismuth producing possibilities at the prop-

erty, a metal badly needed for the war effort.

» » » The Park City Consolidated Mines Company, a Utah Corporation, is taking a position as one of the country's leading lead producers. The company has taken over property at Fredericktown, Mo., which has been completely equipped with mine plant, mill and placed on a regular producing basis. The mill has a capacity of 500 tons per day and the company now ranks eighth among the country's lead producers. A crew of 90 men is employed under the direction of A. R. Riser, superintendent. Mr. Riser was formerly superintendent of the Park City silver property of the company, now idle.

» » » Silver King Coalition Mines Company is operating on a curtailed basis as a result of the manpower shortage. The company which normally operates with a crew of between 500 and 600 men is now employing a crew of under 200 men at its Park City, Utah, property.

» » » Directors of the New Park Mining Company have declared a dividend of 2 cents per share, payable December 15 to stockholders of record November 25. New Park is operating in the southeastern end of the Park City mining region, and is one of the state's newest metal producers. W. H. H. Cranmer is president and general manager.

IDAHO

» » » Sidney Mining Company reports the opening of a major-sized body of zinc-lead ore on the No. 5 level of the Sidney mine on Pine Creek, southwest of Kellogg. For the past 100 ft. the tunnel development has shown a body of ore 6 to 8 ft. wide averaging 5.4 percent lead, 14.2 percent zinc and 2 oz. silver per ton, according to the daily mill feed assays. This development is at a depth of about 800 ft. from the surface. The U. S. Bureau of Mines engineers have tested the vein with diamond drills at a depth of 650 ft. several hundred feet east of the workings. Drill cores from the first hole indicated 8 ft. width of ore which assayed 5 oz. in silver, 8.8 percent lead and 38 percent zinc, while the second hole 300 ft. further east indicated 17½ ft. of ore at about the same depth which assayed 3.2 oz. of silver, 5.7 percent lead and 11 percent zinc. The company has a small mill of 50 tons capacity in the old tram house at the portal of the tunnel but has plans drawn for the building of a 200-ton mill on Red Cloud Gulch further up Pine Creek, which will also be the scene of permanent tunnel operations, as soon as manpower and supplies are available. During the first world war leasers operated the Sidney property and produced 250,000 tons of ore valued at \$18 to \$20 per ton and paid the Sidney Mining Company a royalty which allowed the company to declare nine dividends, totaling \$108,750. At that time the mine was serviced with an aerial tramline costing \$114,500, which was financed by the Bunker Hill Company.

» » » State Mine Inspector Arthur Campbell reports only three fatal mine accidents in Idaho in 1944 against a usual annual total of about 18, although more inexperienced men



Bunkhouses, mill and surface plant, Iderado mine (a Newmont operation) between Ouray and Silverton, Colorado. Snow shed from portal is under construction at right

have been employed. The total number employed, however, is much less than in normal years.

» » » The Bradley Mining Company in the Yellow Pine District of Idaho, is reported to be producing 75 percent of the tungsten and 50 percent of the antimony mined in the United States, all of which has been discovered and accomplished since the Pearl Harbor incident. This company is also preparing for future gold mining operations, having recently purchased extensive holdings in the Buffalo Hump country of Idaho and the Gold King mine in the San Juan district of Colorado.

» » » The Daylight Lease Company, of which Harry P. Pearson is manager, and which holds a 10-year lease on the old Interstate-Callahan mine at the head of Nine Mile Canyon north of Wallace, has made the discovery of what appears in its early stages to be one of the important major deposits of zinc-lead ore recently found in the Coeur d'Alene district. The leasing company first cleaned up all the ore left in the old stopes and dumps by the old company and invested the profits from this operation in driving a crosscut tunnel 2,000 ft. to the Nipsic vein and opened the ore body in a 535-ft. raise, where the vein shows 10 ft. width of high grade zinc and lead ore.

» » » Lucky Friday Mining Company, developing a property at Mullan through a prospect shaft, has received net smelter returns of \$30,937.92 from a shipment of three cars of lead ore concentrates and one car of zinc concentrates. The lead ore settlement was made on a basis of 213.25 oz. of silver and 61.45 percent lead. The concentrates were produced at the Golconda mill from 1,700 tons of mine run ore, which brings the company's total ore production from 800 ft. of shaft development to 15,749 tons and net smelter returns to \$161,359.89.

» » » Bunker Hill & Sullivan Mining & Concentrating Company announces declaration of its fourth quarterly dividend of 12½ cents per share, totaling \$163,500, and payable December 1 to stock of record November 8. This brings the company's total dividend disbursements to \$59,241,241.

» » » Largest dividend payer in the Coeur d'Alene district for the year 1944 is the Hecla Mining Company with a total disbursement for the year of \$1,000,000. The fourth dividend for 1944 has been announced at 25 cents a share for a total of \$250,000, payable December 15 to stock of record November 15 and brings the company's total dividend payments to \$28,155,000. Hecla is the only company in the Coeur d'Alene

district that has not reduced its dividend rate during the current year.

ARIZONA

» » » Leasing of state lands in Arizona for the mining of perlite, an insulation material, is prohibited unless the lands involved are appraised, advertised for leasing and sold in accordance with law governing the removal of natural products from the soil, according to a new ruling by the State Attorney General.

» » » Lead, with some gold and silver, is contained in ores now being shipped from the Juno, New London, and Hidden Treasure mines in Mohave County.

» » » The old Superior and Boston property at Copper Hill, a manganese producer three miles from Globe, is now idle, having been under lease from E. A. Borje, the owner, for some time.

» » » Twenty-five tons of ore daily are being taken from the old dumps of the Gibson mine, 12 miles southwest of Miami, under lease by Norman de Vaux and F. A. Bennett. They have leased from Ross Finley of Globe.

» » » Forty-four claims of the San Manuel project, within a mile of the Mammoth-St. Anthony mine at Tiger, promise a new Arizona large-

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Utah Copper Co.

R. H. Seip, Franklin, N. J.

Personnel Director, The New Jersey Zinc Co.

L. T. Sicka, Bonne Terre, Mo.

St. Joseph Lead Co.

*John Trewcek, Lead, S. Dak.

Safety Engineer, Homestake Mining Co.

Howard I. Young, St. Louis, Mo.

President, American Zinc, Lead & Smelting Co.

*Past General Chairman.

tonnage, low-grade copper prospect from an extensive churn drilling program under the direction of the U. S. Bureau of Mines. The property is under an option to purchase held by the Magma Copper Company of Superior, it is reported.

» » » Ten small mines now in operation in the old Helvetia and Rosemont mining districts of southern Arizona, southeast of Tucson, are shipping an average of 2,000 tons of copper ore monthly to smelters in Hayden and El Paso, Tex., an average that has been maintained for the past eight months, it is reported by the American Smelting and Refining Company. The region was opened up in territorial Indian days, but operations had largely ceased by 1920. Premium prices on copper led to the reopening of the mines two years ago.

» » » A program of expansion at the Bagdad Copper Corporation's mines, 35 miles southwest of Prescott, has been announced to include the installation of two new crushers, 20 ore cars, and other equipment; the erection of 20 new cottages for employees, and the remodeling of a like number. Construction also will include a new club house, recreation center and theater and additions to the school house.

» » » A summary of past production and present operations of Arizona nonmetallic minerals has been published by the Arizona Bureau of Mines at the University of Arizona, including the definitions of the minerals, their chief commercial uses, general specifications, prices, and date of occurrence in the state. The geology of the deposits is not treated in the bulletin. Value of nonmetallics recovered in Arizona prior to 1944 constitutes one and one-third percent of the three and one-half billion dollars set as the value of all minerals produced by the state as of that date, the bulletin reports.

NEVADA

» » » Charles L. Caldwell, veteran Lander County mine owner and operator, says that the people of that county are looking forward to large scale gold dredging operations on the Greenan placer deposits in the flat area below Copper Canyon, 16 miles south of Battle Mountain, just as soon as the ban is lifted on gold mining. Caldwell has indicated that the project will be one of the largest gold dredging operations ever undertaken in Nevada.

The Natomas Company, it is understood, will be the operator, and this company and James O. Greenan are said to have already spent close to

\$150,000 in testing and sampling for dredging possibilities. Natomas has taken a 25-year lease on the Greenan placer and has a 5,000-cu. yd. daily capacity dragline dredge ready for operation as soon as the "green light" is given.

» » » Word received in Reno says that Hall Brothers, of Ely, and Roy Redenbaugh, of Tybo, have made a contract with the Selby Smelter at San Francisco to ship 1,000 tons of slag monthly from the old Tybo mine dumps. The old Tybo mine is 70 miles east of Tonopah, and has between 25,000 and 30,000 tons of slag on the dumps, a test shipment of which returned something more than \$9 a ton, mostly in lead and zinc. The smelter uses the slag for fluxing various metals from the mines of South America and Mexico.

» » » The manpower shortage has become so acute in the Pioche district, producer of lead and zinc, that the Combined Metals Reduction Company is advertising for 100 experienced miners and muckers and offering to train green men for underground work. Combined Metals, in addition to treating its own ore output, is treating ore shipped from the Prince Consolidated, in the same district, and from Ely Valley mines.

» » » Announcement made at Elko says that four carloads of ore a week are being shipped by the Marshall Mining Company from its copper-gold-silver property in Elko County near Contact.

CALIFORNIA

» » » To develop southern California's potential chemical industries, the Los Angeles Chamber of Commerce Industrial Development Committee, of which George J. O'Brien is chairman, has arranged with Dr. Herbert Waterman to conduct a comprehensive survey of local mineral resources used in chemical production.

Dr. Waterman, who is associate professor of chemical engineering and acting head of the Department of Chemical Engineering, University of Southern California, as well as a consulting engineer in his own right, has forwarded a questionnaire to chemical plants in Los Angeles, Orange, San Bernardino and Riverside Counties.

The questionnaire asks for listing of chemical products now being manufactured, minerals used for the operation, proportion of California minerals employed and a recapitulation of the three questions based on estimates for the post-war period.

Chemicals used in metal, petroleum, plastic and other industries will be listed.

"The great variety of minerals available in California should make the state a foremost chemical manufacturing locality," said Waterman, who is serving voluntarily as a contribution to development of the area's chemical potentialities.

"The survey may develop facts to bring to California additional chemical manufacturing industries for which adequate mineral resources are available."

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Prospecting Trenching

(Continued from page 25)

fulness of trenching as an aid to preliminary exploration in soil-covered areas.

Most of the outcrop discoveries in mining districts of Western States were made between 1860 and 1900. A considerable, but rapidly diminishing, number were made between 1900 and 1920, but very few new discoveries have since been made. It is concluded that most exposed vein outcrops in this region have been discovered, but that additional outcrop discoveries will result from the more general use of mechanical trenching equipment.

Lightning Poor Source of Electrical Power

Man's dreams of harnessing lightning flashes for electrical power has been kicked into the realm of scientific nonsense. Dr. Gilbert D. McCann of the Westinghouse Electric and Manufacturing Company states that investigation has shown that the maximum electrical energy that could be obtained from the two billion lightning strokes that annually bombard the total earth's surface is approximately 175 billion kilowatt-hours per year.

"In contrast, the American power station industry alone last year generated 221 billion kilowatt-hours—about one-third of the total electric energy generated in the world."

While lightning carries a terrific wallop, its usable energy is only of momentary duration. The powerful strokes that rip into buildings, split trees and sometimes kill human beings release energy at a very great rate. For instance, a stroke can momentarily produce upwards of 200,000 amperes, enough current to light two hundred thousand 100-watt light bulbs or a city of about 30,000 population. However, it could only do this for a fraction of a second.

At the same time, lightning serves two very useful purposes, by releasing nitrogen from the air and by charging the earth's crust with electricity.

Nitrogen is produced for the earth's surface in this way: The action of the thunderbolts in streaking through the atmosphere with the speed of 60 million miles per hour releases nitrogen from the air. In the form of nitric acid, the nitrogen falls in rain drops and enriches the soil.

"In this way, lightning annually produces nearly 100 million tons of nitric acid—more of this soil builder than is manufactured by all the world's fertilizer plants."

Another lightning phenomenon, at-

tested to by the Westinghouse engineer, is the existence of so-called "ball-lightning." He stated:

"The existence of ball-lightning is now pretty well established and is the only known variation of a lightning stroke, because all others are of essentially the same character."

This form of lightning has been shown to be a whirlpool of ionized gases—a by-product of a full-fledged lightning stroke.

"The ionized gases in this ball circulate at a very high velocity and in so doing insulate the ball from the air around it, enabling it to remain in this state for some time and move about from place to place slowly enough to be seen."

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Hendy Plants for Soviet

Thirty large turbo-generator units for the devastated power plants, factories, and cities of the Soviet Union have been ordered from the Joshua Hendy Iron Works of Sunnyvale, Calif., it is announced by Chas. E. Moore, president of the company.

Preliminary work is already under way on the sets, of which 10 will deliver 2,000 kw. each and the remainder 500 kw. each. The power plants, it is understood, will be used as package units to supply electricity in ravaged areas recaptured by the Russians from the retreating Germans.

These turbines are of a design developed by Hendy for installation as industrial or electric generating plants, and will be marketed by the company as one of its post-war products. Moore also revealed that Hendy is submitting bids to several foreign countries for the manufacture of a variety of industrial power equipment.

New Ankle Protection

Ankle and foot protection against acids, alkalis, oils, solvents and greases is said to be provided by a new spat announced by the American Optical Company, Southbridge, Mass.

The spat is made from a coated fabric which gives the same protection as



rubber but is much lighter in weight and extremely flexible.

Three snap fasteners at the top and two at the bottom make the spat easy to put on and adjust, and assure quick removal. An elastic strap fits under the instep. Large flare assures overall protection of instep. It is neat, snug fitting and comfortable. Pants may be worn over the spat or tucked inside.

New Power Grease Gun

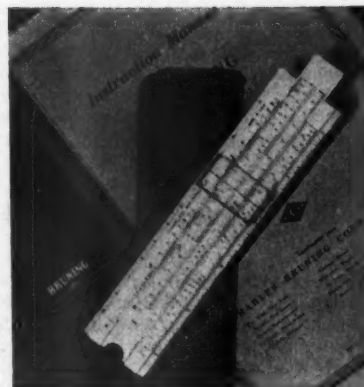
A new Alemite electric portable power grease gun, Model 7190, the latest addition to the Alemite line of industrial equipment, is announced



by the industrial Alemite division, Stewart-Warner Corporation.

The new gun is said to be able to deliver fast, positive high pressure lubrication with all types of lubricants that seek their own level. Equipped with large heavy duty wheels for easy mobility, operation is further facilitated by means of a ball bearing front caster in the steering mechanism.

A quiet driving device connects the heavy duty 1/3 h.p. electric motor to a high pressure grease piston and cylinder, made of specially treated and hardened steel, and fitted to close limits to prevent by-passing. A mercury switch automatically shuts off the motor when 5,000 lb. of pressure have been built up in the delivery hose. The gun stands 28 1/2 in. high, 15 in. wide and 26 in. long.



New Slide Rule

To fill the need for a high-precision, high-quality pocket slide rule which could be offered to engineers at a moderate price, the Charles Bruning Company, New York and Chicago, has just announced its new Bruning 2401, 5-in. Pocket Slide Rule.

In introducing this slide rule, the company stresses the fact that this is not a "duration substitute," but rather a carefully made, smooth-working precision instrument designed for fast, easy operation.

It is said that the graduations, being moulded in, are an integral part of the rule—will not lose visibility through use. Graduations and numerals of the CI scale are in red to facilitate reading. Three screws in the back of the rule provide a simple adjustment for tension on the slide. A, B, CI, C, D, K, S, L and T scales are shown on the rule.

New Expansion Fitting

The O. Z. Electrical Manufacturing Co., of Brooklyn, N. Y., has introduced a new type expansion fitting of novel design. It is reported to be shorter and more compact than previous types, and it requires fewer parts and is easy to install. The standard finish is cadmium plated, but it can also be furnished in bronze. This group of O. Z. fittings was designed to compensate for expansion and contraction in a line of conduit. The head is sealed by a special packing to keep out water or moisture, and is ideal for use on bridges, tunnels, dams or any construc-

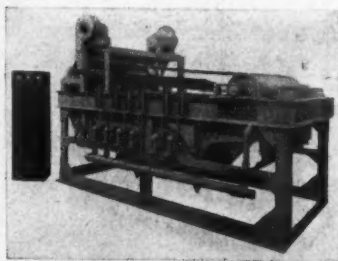
tion where long lines of conduit must be installed.

Complete details of this and other new products, together with the regular O. Z. line are given in a new 140-page catalog. It illustrates and describes, with specifications and price lists, the full O. Z. line including conduit fittings, cable terminators, junction boxes, solderless connectors, power connectors and grounding devices.

Magnetic Ore Separator

Stearns Magnetic Mfg. Co., Milwaukee, has recently developed a magnetic separator reported to have distinctive and exclusive features, to be used principally for concentrating of ores and minerals by the wet process.

The material goes into a simple enclosed spout and a controlled water pressure feed. This creates a high disseminating effect to spread the material in a thin, uniform layer to the underside of a submerged moving belt. Here it is picked up by the intercepting magnetic field and carried



through the successive magnetic zones individually controlled by rheostats which provide a clean product of concentrates, middlings and tails.

The water sprays are of ingenious design and conveniently located to control the direction and amount of flow to prevent contamination of material from floating impurities.

Clean separation by the magnetic separator unit is said to be further augmented by a special patented design of magnet pole pieces which subject the material to a zig-zag movement as well as a rolling, cleaning action while in process.

The magnet poles and belt are submerged while the coil windings are not submerged, and, therefore, not subject to moisture or sweating. They are amply protected, however, against physical damage and water splash by metal jackets which provide ventilation by complete air circulation.

Through this wet method of magnetic separation unusually high concentrate recovery is said to be possible with maximum capacity and low cost.



New Face Shields

The new "Hundred" series of face shields, designed for comfort for the wearer, announced by the Boyer-Campbell Co., 6540 St. Antoine St., Detroit 2, Mich., also has the characteristic of complete interchangeability of parts. There are "100," "200," "300," and "400" models, each of them being identified by a variance in design of the head gear; for each model there is a choice of three different thicknesses and three different sizes of cellulose acetate general purpose windows—three different sizes of 24-mesh screen windows for heat protection and a fiber front for scarfing and welding. The complete interchangeability of these parts is said to make practical a face shield for any industrial use with a minimum of stock.

New Plastic Packing

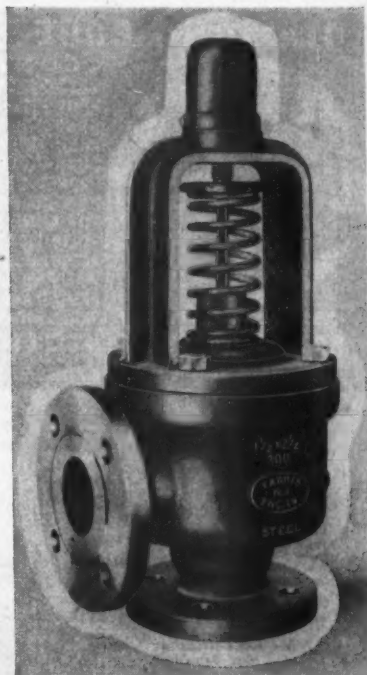
The demand for packings of the plastic type is steadily growing in certain industries. To meet this demand, Greene, Tweed & Company, 4377 Bronx Boulevard, New York 66, N. Y., has introduced a new development—Palmetto Plastic Packing.

In this new packing, lasting lubricating effect is reported as being obtained by combining graphite with flakes of soft, anti-friction metal. These two lubricating agents are distributed evenly throughout long-line fibres of asbestos, and the whole thoroughly mixed with a special heat-resistant binder. The mixture is then formed into continuous lengths by an extruding operation which gives the packing a square outline. This shape may be altered, if necessary, to suit special requirements, as compression, rolling or pounding are said not to impair the usefulness of Palmetto Plastic Packing.

New Venturi-Type Safety Valve

Farris Engineering Co., Palisades Park, N. J., manufacturers of precision valve specialties, announces the development of a line of Venturi-Type Safety Valves, with reported special provisions for constant accurate blow-off, exceptionally great capacity, complete tightness of re-seating, minimum escape of vapor into the surrounding space, and elimination of angular distortion and fouling.

The inlet venturi tube nozzle of this design is said to give a clear unobstructed port and guided high velocity of the steam, which results in high lift and correspondingly great capacity. One of the many outstanding features of these valves is the patented "separator bell." This device causes the steam to make three changes in direction before passing into the atmosphere, and includes a



drain for the condensed moisture into the body. Escape of vapor into the air is thereby minimized. The "separator bell" also helps to keep the spring cool by preventing steam from striking the spring, and improves freedom and maintenance of alignment by providing for higher support of the spring than in other designs.

Correct alignment of the stem, on which complete tightness of re-seating depends, is further maintained by precision machine work throughout the valve, and by top guidance of the stem in two bearings, instead of one or three as employed in other designs.

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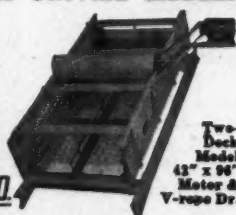
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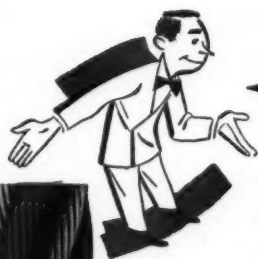
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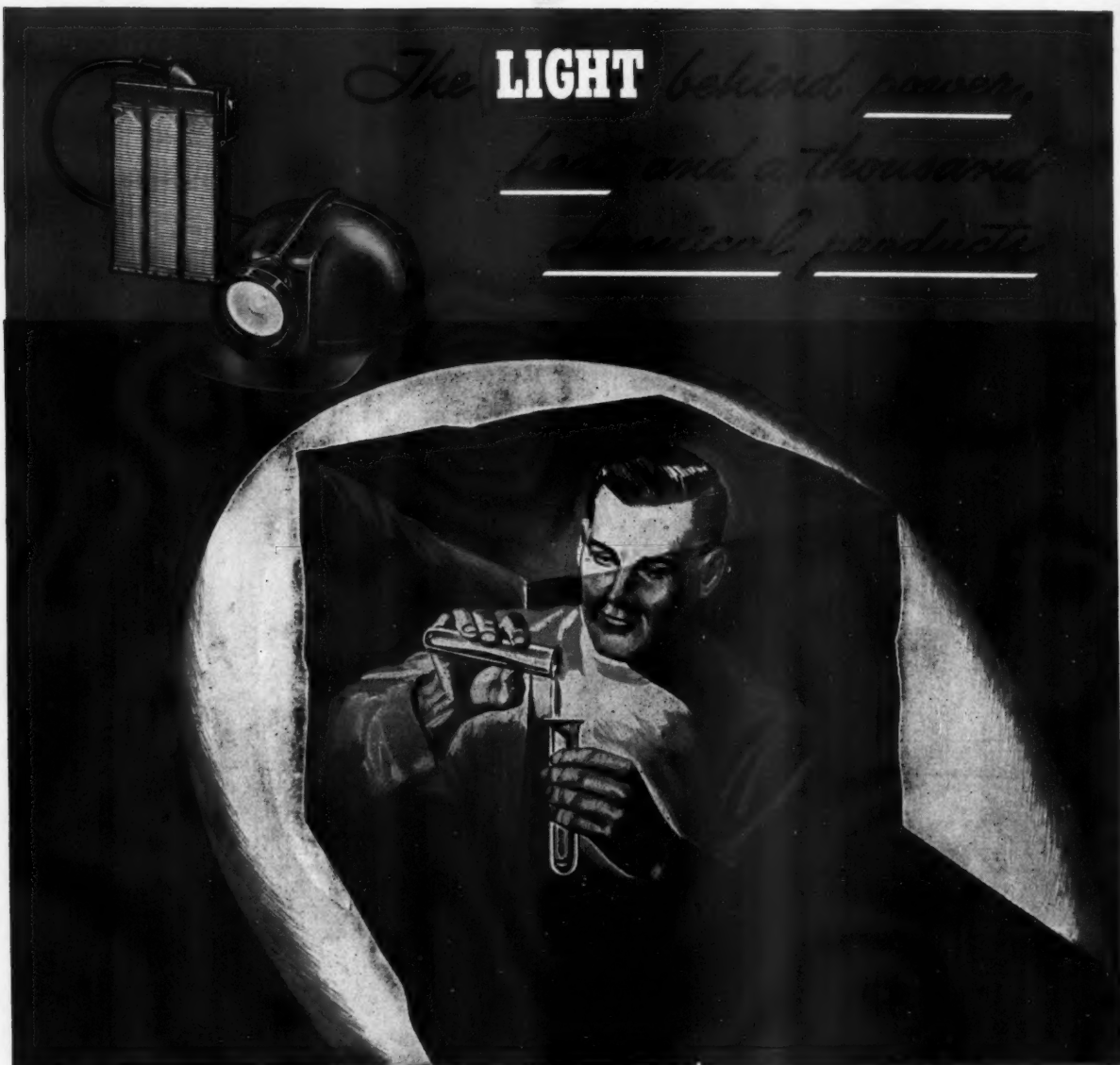
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